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SMITHSONIAN INSTITUTION
BUREAU OF AMERICAN ETHNOLOGY
BULLETIN 174

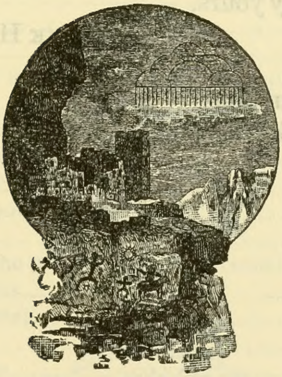
# AN INTRODUCTION TO KANSAS ARCHEOLOGY

By WALDO R. WEDEL

*WITH*

## DESCRIPTION OF THE SKELETAL REMAINS FROM DONIPHAN AND SCOTT COUNTIES, KANSAS

By T. D. STEWART



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# LETTER OF TRANSMITTAL

Smithsonian Institution,
Bureau of American Ethnology,
*Washington, D. C., September 30, 1958.*

Sir: I have the honor to submit the accompanying manuscript, entitled "An Introduction to Kansas Archeology," by Waldo R. Wedel, with "Description of the Skeletal Remains from Doniphan and Scott Counties, Kansas," by T. D. Stewart, and to recommend that it be published as a bulletin of the Bureau of American Ethnology.

Very respectfully yours,

Frank H. H. Roberts, Jr.,
*Director.*

Dr. Leonard Carmichael,
*Secretary, Smithsonian Institution.*

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# FOREWORD

This study began as a routine report on three seasons of archeological fieldwork in Kansas, conducted by the writer for the United States National Museum in 1937, 1939, and 1940. The fieldwork was essentially a survey; it involved some surface collecting and the limited sampling of certain selected sites, but no comprehensive excavations. The sampling was designed to test the archeological possibilities in various sections of the State, with the possibility in mind of future extended investigations if and where warranted.

As with so many other programs of the time, completion of this one was made impossible during the war years. Both fieldwork and writing came to a halt, the latter to be resumed in 1945. Shortly came further interruption when the Smithsonian Institution entered into an agreement with the National Park Service to participate in the archeological salvage work linked with the post-war Federal water-control program. The writer was detailed by the National Museum for four summers and intermittently otherwise to the newly organized River Basin Surveys and was assigned the task of organizing and setting in motion the salvage program in the Missouri Basin. Not until 1950 was there again opportunity for resuming the Kansas report.

During the long delay that followed completion of the fieldwork, the conviction grew that a routine report was no longer adequate. Many of the archeological materials recovered clearly stood in close relationship to materials on various time levels in adjacent States. Some of them as clearly called for further researches in the accumulating literature bearing on the ethnohistory of the Central Plains. Finally, it was abundantly evident that much of the previous work in Kansas, though carried on intermittently and often sketchily reported, had definite bearing on problems raised in our work from 1937 to 1940, and that this should be fully utilized wherever possible.

Out of these and other considerations finally emerged the idea of expanding the report to include a comprehensive review of the available ethnohistorical, archeological, and geographical data bearing on the aboriginal occupancy of Kansas. It is the writer's hope that inclusion thus of a considerable body of ancillary data, much of it from exceedingly obscure sources, will simplify the labors of future workers in the area, besides adding justification to this study as an introduction to the archeology of Kansas.

The list of individuals to whom I owe a debt of gratitude is a long one. For their ready endorsement of my initial proposal in 1937 and for thus making possible the fieldwork on a continuing basis, I wish to thank especially the following: Dr. A. Wetmore, then assistant secretary in charge of the United States National Museum; F. M. Setzler, head curator of anthropology; and my immediate administrative superior, Neil M. Judd, curator of archeology. Thanks are also due Dr. Remington Kellogg, director of the National Museum, for approval of subsequent shorter trips to Kansas for follow-up work on various pertinent problems.

Much of the success which attended our survey efforts, consummated in the field for less than $4,000 dollars, must be attributed to the splendid cooperation I received from the various members of the field parties. Few in number and sadly underpaid by present standards, these men uncomplainingly worked long hours—digging by day, cataloging at night—and accepted cheerfully the usual inconveniences of camp life, of recurrent dust storms, and of frequent changes of location. To Marvin F. Kivett, my field assistant during all three seasons, I am particularly indebted. Of him I should like to say that in a quarter century of activity in Plains archeology, I have known no worker who has shown better field technique, keener insight, higher personal and professional integrity, or deeper comprehension of the task at hand. In addition to Kivett, the 1937 field party included Kenneth G. Orr, R. G. Slattery, and Hugh Stabler. Slattery was a member of the 1939 party, which also included Karl Schmitt, J. M. Shippee, Henry Hornblower II, and W. B. Oswald. Shippee and Slattery were again members of the party in 1940, which included also John Giles as cook. Philip Drucker was a welcome addition to the 1939 group for two weeks; and Louis Essex volunteered his services for several days during the work in Cowley County. To any of the above who may read these lines, I send greetings and thanks for a job well done.

To the following property owners, lessees, tenants, administrators, business firms, and others, I am grateful for excavation privileges on one or another of the various sites investigated: George Meidinger, Pete Leiffering, J. O. Corcoran, Ed Haid, Henry Otto, Kansas Evergreen Nurseries, Ras Matherson, A. W. Guthrie, B. E. Hale, Dave Leahy, Jr., Howard Young, C. D. Pottorff, James Risston, E. W. Walter, Ed Tobias, C. F. Thompson, Mr. and Mrs. John Malone, Homer Peverley, John Goff, Alfred Larcom, Ernest Muret, T. N. Haggard, and John Boggs and other officials of the Arkansas City Country Club. With gratifyingly few exceptions, the above cheerfully extended permission for us to work when we called on them, and in but two instances were restrictions placed on the extent of digging we could do.

Appreciation must also be expressed to numerous individuals who helped in various other ways. Some of these gave access to important collections of local material; others acted as guides to sites that might otherwise have escaped our notice, or functioned as intermediaries in our negotiations with reluctant landowners. In northeastern Kansas, Fenn Ward of Highland was most helpful, as he has been through correspondence since the close of our fieldwork. Mr. H. M. Trowbridge of Bethel made available for examination an important Hopewellian collection that originated near his home in Wyandotte County. In central Kansas, Mr. and Mrs. G. L. Whiteford of Salina provided many helpful suggestions, supplied numerous photographs, and permitted study of an exceptionally important collection of prehistoric materials from a large burial ground and village site investigated by them. Horace Jones, newspaperman and enthusiastic historian of Lyons, made our work in Rice County immeasurably easier and vastly more productive than it otherwise would have been; and through the columns of his paper, he enabled us to locate and examine many puebloan potsherds from local sites that otherwise would not have come to our attention. In southern Kansas, Bert Moore of Winfield was a frequent visitor to our excavations, guided us to other sites in Kansas and Oklahoma, and assisted unendingly with local contacts. Others who merit special notice here include Dr. Norman L. Roberts, Manhattan; Stanley Dienst, Coffeyville; Thomas M. Galey, Wichita; B. F. McDaniel, Dexter; Mr. and Mrs. J. E. Harclerode, Ottawa; A. W. and Earl Monger, Larned; George C. Estep, Garden City; William O. Leuty, Ellsworth; Phil Hohl, Bushton; Lowell Peverley, Geneseo; and Eugene Wing, Pratt. The extent and nature of my indebtedness to these individuals will be evident in other sections of this report.

To a host of professional colleagues, anthropological and other, in the Smithsonian and outside, I am heavily indebted for expert opinions, identifications, and numerous helpful suggestions as this study progressed. Among present and former members of the National Museum staff, the following should be mentioned in connection with specified identifications: A. Wetmore and Herbert Friedmann, bird bones; R. Kellogg, D. H. Johnson, H. M. Setzer, and Ray Gilmore, mammal remains; C. V. Morton and A. C. Smith, plant remains; J. P. E. Morrison, molluscan remains; E. P. Henderson, minerals; G. A. Cooper, invertebrate fossils; C. M. Watkins and M. L. Peterson, early White trade and contact materials; T. D. Stewart and M. T. Newman, human skeletal materials; John C. Ewers, ethnoarcheological items; D. M. Cochran, reptile bones; E. D. Reid and L. P. Schultz, fish remains. Outside the Museum staff, E. A. Goldman and S. P. Young, Fish and Wildlife Service, supplied important observations on dog remains. R. W. Brown and L. G. Henbest,

U. S. Geological Survey, identified certain paleobotanical and mineralogic items. F. H. H. Roberts, Jr., Bureau of American Ethnology, kindly made available unpublished and restricted materials collected in Kansas by the River Basin Surveys and not yet reported in print. Mrs. M. C. Blaker, archivist of the Bureau of American Ethnology, patiently tracked down for me various manuscripts in her files.

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With many of those named in the preceding paragraphs, I have had fruitful discussions that materially clarified points about which I was in doubt, and for this I am most grateful. In the final stages of the manuscript, I have had the benefit of helpful criticism from Mr. George Metcalf, aid in the Division of Archeology, who cheerfully read long sections and offered his comments and views. R. G. Paine, formerly aid in the Division of Archeology, drafted several of the site and other maps included in this report. All drawings of specimens are the work of Betty E. Baker, scientific illustrator in the Department of Anthropology. The arduous task of typing the manuscript was accomplished at various times by three secretaries in the Division: Mrs. Leta B. Loos, Miss Lucy H. Rowland, and Mrs. Jeraldine M. Whitmore.

I cannot fail to acknowledge here my heavy debt to one of the pioneers in Plains archeology, the late A. T. Hill of Lincoln, Nebr., and to the professional who afforded me my first opportunity to work in the Plains, Dr. William Duncan Strong. Mr. Hill took a deep personal interest in the formulation of my field program, visited our camp at a number of the sites, and contributed many helpful suggestions for guidance of the work, especially in western Kansas. To Strong and to Hill, I owe in large part my initial indoctrination into the field of Plains archeology; and I trust the present study will reflect no discredit on our associations beginning more than a quarter of a century ago.

Finally, to my patient and forbearing wife, Mildred Mott Wedel, go my sincere and affectionate thanks for urging the study on its way when growing curatorial responsibilities seemed overdemanding and the road ahead looked all but impassable. I am indebted to her especially for numerous suggestions in the section on ethnohistory, as also in that reviewing the archeological complexes of eastern Kansas. She has made available much unpublished information on Oneota materials, and has read long sections of manuscript and proofs. The reader, no less than I, will be grateful to her for the index, which she painstakingly compiled. Here, as elsewhere, I gratefully acknowledge the assistance received, regret the possible omission of deserving names and credits, and cheerfully assume responsibility for any misuse I may have made of the assistance so readily extended.

# AN INTRODUCTION TO KANSAS ARCHEOLOGY

By Waldo R. Wedel

## INTRODUCTION

When I was invited, shortly after joining the National Museum staff in 1936, to submit a proposal for a field project for the following summer, my immediate selection of Kansas as the locus of operations was based on several considerations. For one thing, probably no State in the Great Plains region was so inadequately known, ethnologically or archeologically. Most of the tribes—Siouan, Caddoan, and other—known to have inhabited the State in historic times prior to reservation days had passed from the scene when trained ethnologists began their studies. No ethnohistorical work of any note had been undertaken. As to archeology, notable contributions had been made here and there by a handful of individuals, but mostly before 1910. No general systematic attack had been made on the prehistory of the region nor had anyone attempted to place the State in its proper position in the emerging picture of Plains prehistory. No local institution or organization was engaged in any sort of anthropological research within the State; and the large-scale archeological work relief operations of the 1930's had no counterpart in Kansas.

Yet there was ample reason to believe that the notion, still lingering in some quarters, of the Great Plains as a region "largely bare of archeology," was no more applicable to Kansas than it was to Nebraska. As Strong pointed out in his classic introduction to Nebraska archeology, perusal of the limited literature available showed that Kansas was "an extremely promising archeological field that up to the present has received nothing even approaching systematic investigation." Having participated in five productive and stimulating seasons of fieldwork in southern and western Nebraska from 1930 to 1934, I was entirely convinced of the accuracy of this trenchant observation. Realization thus of the possibilities, grafted onto lingering memories of fruitful boyhood "relic"-hunting trips in central Kansas, provided an initial stimulus for launching sustained field investigations when the opportunity at last arrived.

There were other considerations. The accumulation of systematically gathered information on the archeology of neighboring States was imparting new insights into the background and antecedents of historic Plains Indian culture. Lack of equally sound and up-to-date information on Kansas was increasingly troublesome to students concerned with the wider relationships of the prehistoric Plains peoples. A significant proportion of the archeological resources of the region, long recognized by students as "an important laboratory for anthropological research" was thus unavailable for scientific examination. Inferences were possible, of course, but these were manifestly unsatisfactory. After all, there was a long record of "inferences" that the Plains had no worthwhile archeology, if indeed they were inhabitable before adoption of the horse by the Indian.

The geographic location of Kansas, straddling the shifting borderline between the humid East and the arid West, was another factor. In the middle 1930's, much of the Great Plains was in the tightening grip of a record-breaking drought. Widespread and spectacular dust storms, recurrent crop failures, and extensive dislocation of the human economy could be observed on every hand. Without subscribing to any theory of environmental determinism, it still seemed pertinent to inquire whether the archeological record might not show that the earlier prewhite populations were in some measure likewise influenced by the vagaries of the regional environment.

The primary objectives of the National Museum survey of Kansas, then, may be summarized as follows:

(1) To sample the archeological materials in various sections of the State, with a view to determining their general nature and their variability through time and space;

(2) To identify wherever possible the remains of historic tribal groups, such as the Kansa, and thus to obtain some insights into their antecedents;

(3) To assess the materials found with respect to their similarities to, and differences from, the archeological complexes already recognized in adjacent States, such as Nebraska, where geographical conditions were broadly similar;

(4) To gather information bearing on the manner in which the native populations, at various periods and in various regions, adjusted their way of life to their natural environment;

(5) To integrate these findings, tentative though they might be, into the larger picture of native man's occupation of the Great Plains;

(6) To suggest problems that might profitably be attacked next.

The core of this study is, as previously suggested, the data and materials gathered in three seasons of fieldwork. This consisted basically of 15 to 18 weeks annually of survey and limited excavation during the summers of 1937, 1939, and 1940. A few of the localities were revisited in subsequent years, but visits were incidental to other activities and without opportunity or means for further excavation. In 1954, I spent approximately 10 days in brief observations at sites and localities not previously worked, a prime consideration then being the effects of intense and prolonged drought on surface water supplies, natural vegetation, and the corn crop. All of these field observations, however brief, as well as the incidental opportunities to view additional local collections, have been drawn on for this paper.

In the sections which follow, I have first reviewed at some length the environmental setting, the ethnohistorical background, and the published record of previous archeological work in Kansas. Detailed presentation of results of the National Museum's fieldwork is followed by a short section classifying the archeological data in terms of the larger complexes recognizable. Another section endeavors to summarize in some detail the nature, distribution, and wider relationships of these larger complexes, and this is followed by a discussion of the chronological situation. The final sections offer a tentative reconstruction of Kansas prehistory, and a review of the achievements of the survey in terms of the objectives listed above.

## THE ENVIRONMENTAL SETTING

To the traveler from the wooded lands of the Eastern United States, journeying through Kansas along any of the great transcontinental thoroughfares, the general impression is likely to be one of monotonous sameness of landscape. It is a typical Plains State—an area of low relief, with no mountains, few trees, and little surface water. The regional variations that occur from east to west are not usually very striking or abrupt, and easily elude the casual observer who stays on the main highways and rail routes. To those who inquire more closely into the details of topography, native flora and fauna, climate, and other aspects of the environment, it soon becomes apparent, however, that there are natural variations which bear, directly or indirectly, on man's utilization of the land.[1]

Kansas is an approximate parallelogram of some 82,200 square miles lying in the heart of the United States. Its northeastern boundary for 100 miles is the winding trench of the Missouri River; the southeastern corner touches the Ozark plateaus. Thence it stretches westward more than 400 miles between the 37th and 40th parallels of north latitude far into the Great Plains. Its surface rises gradually and irregularly from less than 700 feet above sea level near the southeastern corner on the Oklahoma State line to just over 4,100 feet on the Colorado line near the northwest corner. This surface has been developed on a generally simple yet varied geologic structure, and so is by no means uniformly flat and featureless. Down its long uneven slope, streams have furrowed deep wide valleys through which the

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[1] The descriptive section which follows is based largely on Adams, 1902; Cockrum, 1952; Fenneman, 1931; Flora, 1948; Gates, 1937 and 1940; Johnson, 1900; Parker, 1911; Schoewe, 1949 and 1951; Smith, 1940; and Snow, 1872.

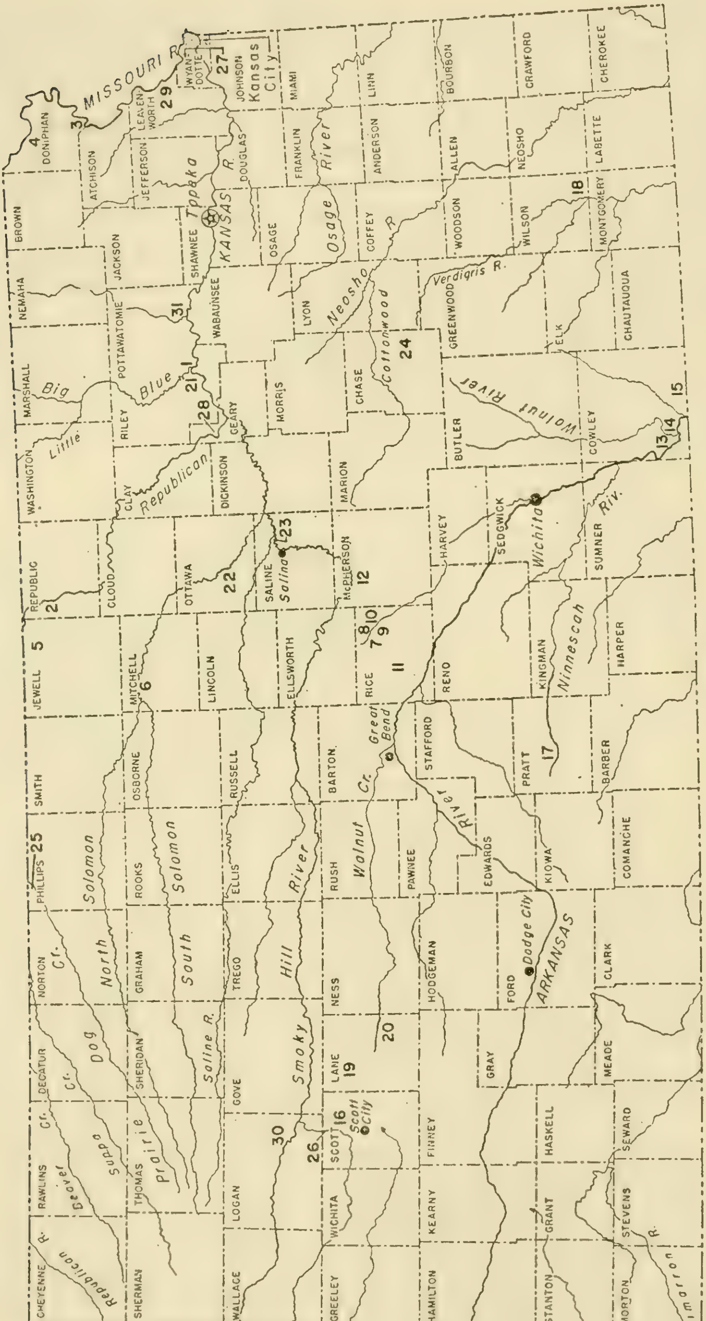
MISSOURI R.
Kansas City
Topeka
KANSAS R.
Salina
Wichita
Great Bend
Dodge City
Scott City
DONIPHAN
ATCHISON
LEAVENWORTH
WYANDOTTE
JOHNSON
MIAMI
LINN
BOURBON
CRAWFORD
CHEROKEE
BROWN
JEFFERSON
DOUGLAS
FRANKLIN
ANDERSON
ALLEN
NEOSHO
LABETTE
NEMAHA
JACKSON
SHAWNEE
OSAGE
COFFEY
WOODSON
WILSON
MONTGOMERY
MARSHALL
POTTAWATOMIE
WABAUNSEE
LYON
GREENWOOD
ELK
CHAUTAUQUA
WASHINGTON
RILEY
GEARY
MORRIS
CHASE
BUTLER
COWLEY
CLAY
DICKINSON
MARION
HARVEY
SEDGWICK
SUMNER
REPUBLIC
CLOUD
OTTAWA
SALINE
McPHERSON
RENO
KINGMAN
HARPER
JEWELL
MITCHELL
LINCOLN
ELLSWORTH
RICE
STAFFORD
PRATT
BARBER
SMITH
OSBORNE
RUSSELL
BARTON
PAWNEE
EDWARDS
KIOWA
COMANCHE
PHILLIPS
ROOKS
ELLIS
RUSH
HODGEMAN
FORD
CLARK
NORTON
GRAHAM
TREGO
NESS
GRAY
MEADE
DECATUR
SHERIDAN
GOVE
LANE
FINNEY
HASKELL
SEWARD
RAWLINS
THOMAS
LOGAN
SCOTT
WICHITA
KEARNY
GRANT
STEVENS
CHEYENNE
SHERMAN
WALLACE
GREELEY
HAMILTON
STANTON
MORTON
Big Blue
Little
Republican
Osage River
Neosho R.
Cottonwood
Verdigris R.
Walnut River
Wichita
Riv.
Ninnescah
Solomon
North Solomon
South Solomon
Saline R.
Smoky Hill River
Walnut Cr.
ARKANSAS River
Prairie Dog Cr.
Sappa Cr.
Beaver Cr.
Republican R.
Cimarron R.
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FIGURE 1

(For legend, see facing page.)

north half of the State drains eastward via the Smoky Hill–Kansas River system and the Osage into the Missouri, and the south half by way of the Arkansas into the Mississippi. Along these valleys, thin winding ribbons of hardwood timber run westward from the oak-hickory forests of the central Mississippi valley to interfinger with the grassy uplands of the Great Plains. Thus, because of its geographic location and its considerable east-west extent, what is essentially a Plains State exhibits a diversity of terrain, climate, soils, native flora, and fauna greater than is commonly supposed. (Fig. 1.)

In terms of the major physical divisions of the United States, Kansas lies almost wholly within the Interior Plains (Fenneman, 1931; Schoewe, 1949). The exception is a small gently sloping area of some 50 square miles in the extreme southeastern corner of the State, bounded on the west by Spring River, which is assigned to the Ozark Plateau. As manifested in Kansas, the Interior Plains comprise two divisions or provinces, both of which extend far beyond the borders of the State (fig. 2). These are the Central Lowland, including roughly the eastern third of Kansas, and the Great Plains, to which the remaining two-thirds are assigned. The Central Lowland in northeastern Kansas, which was subjected to glacial activity, is characterized by submaturely to maturely dissected till plains; south of Kansas River

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FIGURE 1.—Map showing location of certain archeological sites in Kansas. Numbers on map refer to sites in text, as follows:

1—14PO24, Kansa site, ca. 1800–30, Pottawatomie Co.
2—14RP1, Pawnee site, pre-1800; Republic Co.
3—14DP2, Doniphan site; Donipan Co.
4—14DP1, Fanning site, Doniphan Co.
5—14JW1, Warne site, Jewell Co.
6—14ML1, Glen Elder site, Mitchell Co.
7—14RC8, Tobias site, Rice Co.
8—14RC9, Thompson site, Rice Co.
9—14RC3, Hayes site, Rice Co.
10—14RC2, Major site, Rice Co.
11—14RC5, Malone site, Rice Co.
12—14MP1, Paint Creek site, McPherson Co.
13—14CO1, Larcom-Haggard site, Cowley Co.
14—14CO2 (Elliott) and 14CO3 (Arkansas City Country Club), Cowley Co.
15—14CO5, Maple City quarries, Cowley Co.
16—14SC1, "El Cuartelejo," Scott Co.
17—14PT1, Pratt site, Pratt Co.
18—14WN1, Neodesha "fort," Wilson Co.
19—14LA1, Pottorff site, Lane Co.
20—14LA2, Walter site, Lane Co.
21—14RY21, Griffing site, Riley Co.
22—14OT5, Minneapolis site, Ottawa Co.
23—14SA1, Whiteford site, Saline Co.
24—14CS1, Roniger site, Chase Co.
25—14PH4, Woodruff ossuary, Phillips Co.
26—14SC2, Young burial site, Scott Co.
27—14WY1, Trowbridge site, Wyandotte Co.
28—Younkin mound, Geary Co.
29—Lansing Man, Leavenworth Co.
30—Twelve-mile Creek, Logan Co.
31—14PO26, Dike site, Pottawatomie Co.

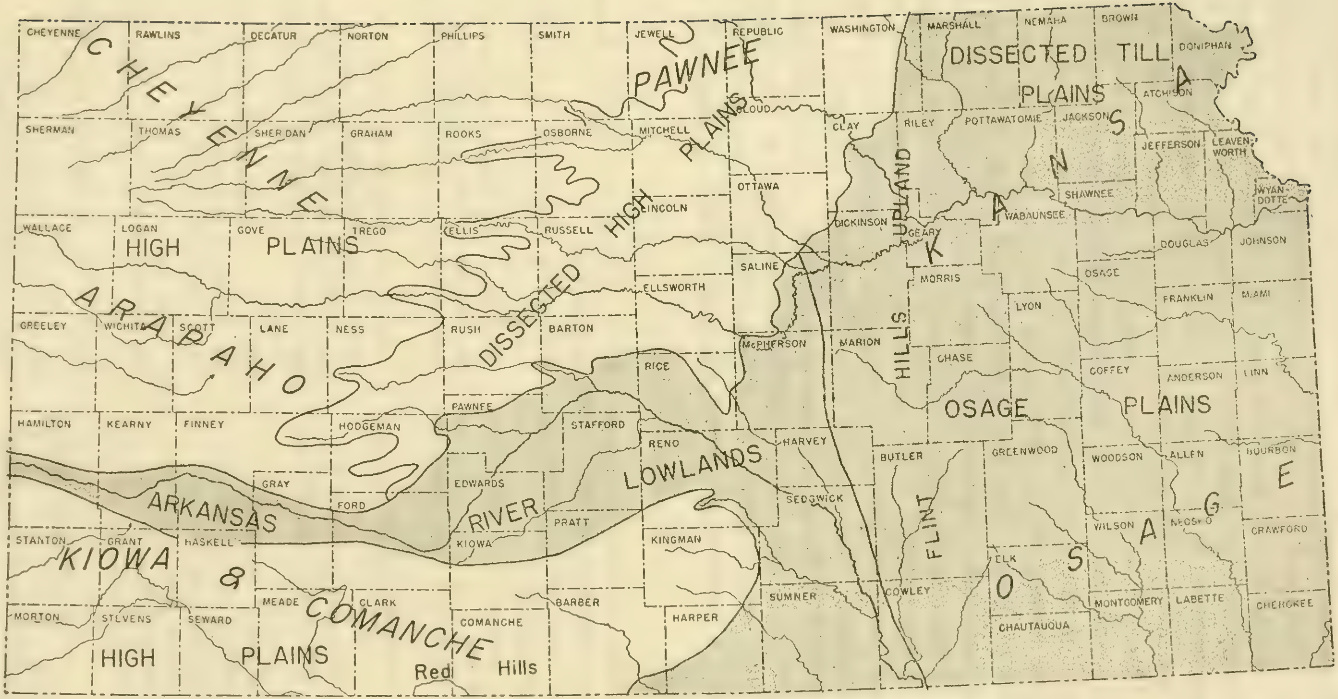
CHEYENNE
ARAPAHO
KIOWA
&
COMANCHE
PAWNEE
KANSA
OSAGE
DISSECTED TILL PLAINS
HIGH PLAINS
DISSECTED HIGH PLAINS
UPLAND
HILLS
OSAGE PLAINS
FLINT
ARKANSAS RIVER LOWLANDS
HIGH PLAINS
Red Hills
CHEYENNE
RAWLINS
DECATUR
NORTON
PHILLIPS
SMITH
JEWELL
REPUBLIC
WASHINGTON
MARSHALL
NEMAHA
BROWN
DONIPHAN
SHERMAN
THOMAS
SHERIDAN
GRAHAM
ROOKS
OSBORNE
MITCHELL
CLOUD
CLAY
RILEY
POTTAWATOMIE
JACKSON
ATCHISON
JEFFERSON
LEAVENWORTH
WYANDOTTE
OTTAWA
SHAWNEE
WALLACE
LOGAN
GOVE
TREGO
ELLIS
RUSSELL
LINCOLN
DICKINSON
GEARY
WABAUNSEE
DOUGLAS
JOHNSON
SALINE
MORRIS
OSAGE
ELLSWORTH
LYON
FRANKLIN
MIAMI
GREELEY
WICHITA
SCOTT
LANE
NESS
RUSH
BARTON
McPHERSON
MARION
CHASE
RICE
COFFEY
ANDERSON
LINN
PAWNEE
HAMILTON
KEARNY
FINNEY
HODGEMAN
STAFFORD
RENO
HARVEY
BUTLER
GREENWOOD
WOODSON
ALLEN
BOURBON
GRAY
EDWARDS
FORD
SEDGWICK
PRATT
WILSON
NEOSHO
CRAWFORD
STANTON
GRANT
HASKELL
KIOWA
KINGMAN
ELK
MEADE
CLARK
BARBER
SUMNER
COWLEY
MONTGOMERY
LABETTE
CHEROKEE
MORTON
STEVENS
SEWARD
COMANCHE
HARPER
CHAUTAUQUA

FIGURE 2.—Historic Indian tribes in relation to physiographic divisions in Kansas. Physiography generalized after Schoewe, 1949; shading, Central Lowland; unshaded, Great Plains.

are unglaciated scarped plains beveling faintly inclined rock strata with the main streams entrenched. The western limit of the Central Lowland corresponds approximately to a line running irregularly south and west from northeastern Washington County to southwestern Harper County. West of this and north of the Arkansas River valley is a rough maturely to submaturely dissected plateau and Plains country; and another heavily eroded tract known as the Red Hills appears south of the stream. Between these two, in and around the northward bend of the Arkansas, is an area of much lower relief termed the Great Bend Lowland. All of this was assigned by Fenneman to his Plains Border division; but Schoewe and others have suggested inclusion of the Great Bend Lowland with the Central Lowland province and designation of the broken areas to north and south as the Dissected High Plains. In these latter areas, the east- and south-flowing streams have cut deeply into the edge of the uplands and thus by headward erosion are steadily widening the lowlands on the east at the expense of the High Plains. West of this zone of active erosion are the High Plains proper, comprising somewhat more than a third of the State. These were long thought to be the broad interstream remnants of smooth fluviatile plains that in Tertiary times extended from the Rocky Mountains eastward far across Kansas and Nebraska. Recent studies have indicated, however, that "the area has been extensively modified by several cycles of erosion and deposition since Pleistocene time, and it seems clear that most of the present High Plains surface was shaped in late Pleistocene and Recent times" (Frye, 1946, p. 73). A treeless country carpeted with short grass sod, having a semiarid climate and little surface water, this region has long influenced the popular conception of the landscape of the trans-Missouri West generally.

To visualize more clearly the opportunities offered, and the limitations imposed, by the environment here to human occupancy, it will be necessary to examine more closely the region briefly characterized above. Several considerations should be borne in mind.

For one thing, eyewitness accounts of the Kansas landscape go back, at most, some four centuries; and for more than half this period, they are sketchy in the extreme. The archeological record, on the other hand, indicates a span of human existence covering several thousand years. For most of this span, the environmental setting must be inferred from geologic, paleontologic, pedologic, and other evidence. Secondly, Kansas occupies a transitional zone climatically intermediate between the humid East and the arid West. Like all such intermediate regions, it has long been subject to climatic fluctuations of greater or lesser magnitude. That some of these may have affected man in prehistoric times, as in historic, is recognized; but the degree and duration of these influences and their effects on population movements are still obscure. Thirdly, from geologic and paleontologic studies (Frye and Leonard, 1952) it seems clear that the grassy plains of Kansas are not a recent development, much less do they owe their vegetational and faunal peculiarities to human activity primarily. Buried or "fossil" soils correlated with all interglacials are identified as grassland soils, indicating that throughout Pleistocene times the vegetational cover has been grass rather than trees; and molluscan fossils point to a climatic control like the present one since Bradyan (mid-Wisconsin) times. As a part of the greater central North American grassland, the Kansas landscape has a geologic and climatologic basis; and its vegetative and faunal characteristics long antedate man's demonstrable presence on the scene. (See also Wedel, 1957.) There is, in short, no present evidence that the human activities of the past few thousand years have been carried on in an environmental setting significantly different from the present, as for example, in a woodland as contrasted to a grassland with tree-fringed watercourses.

The High Plains include some 30,000 square miles in western Kansas (Johnson, 1900; Schoewe, 1949, pp. 311–330). They are characterized by broad monotonously flat uplands and poorly developed surface drainage. The horizon line almost everywhere is one of phenomenal flatness and uniformity. The uplands are dotted with shallow saucerlike depressions ranging in diameter from a few to several thousand feet, and these may contain water for days or even weeks after heavy rains. Larger depressions, such as Scott Basin and Shallow Water Basin south of Scott City, receive the runoff from intermittent streams and here, too, ephemeral lakes sometimes form before the waters sink into the ground. Circular sinkholes with steep to precipitous walls, partially filled with water and sometimes of considerable size, result from the collapse of solution caverns formed by underground waters. All these, however, are comparatively minor phenomena and do not materially affect the general impression of flatness. Relief is greater along the stream valleys. The Smoky Hill, Arkansas, and Cimarron Rivers traverse the region in bluff-lined valleys; and along the first of these, erosion of the chalk beds has produced badlands areas and occasional buttes, pinnacles, and other picturesque features. Where the Smoky Hill and its usually short tributaries have cut through the unconsolidated Tertiary silts, sands, and gravels into the impervious underlying rock formations, seeps and permanent springs occur and good water may be found in limited quantity. North of the Smoky Hill, the Saline and Solomon Rivers have their sources in these plains, as do three creeks—Prairie Dog, Sappa, and Beaver—which run northeast through attractive terrace-lined valleys (cf. Fremont, 1845, p. 109) to empty into the Republican River just north of the Kansas-Nebraska State line. All of these are dry or intermittent in their upper reaches, and have wide shallow valleys; they develop a permanent flow as they approach the 100th meridian, where their valleys have been deepened to the contact between Tertiary sediments and the older rocks. The Arkansas and Cimarron Rivers, rising in mountainous regions outside the State, may be classed as permanent streams; but their flow usually diminishes markedly toward the east and often sinks into the thick beds of sand through which they run. Sand dunes, both stabilized and active, border the south side of the Arkansas from the Colorado line eastward to Dodge City or beyond, and also cover a large tract south of the Cimarron.

The High Plains are the short-grass country. The uplands, where not broken out for cultivation, are dominated by buffalo and grama grasses, both of which are highly resistant to drought and close grazing and, in addition, cure well in the dry fall to produce palatable and highly nutritious winter forage. Yucca, prickly pear cactus, and sage are locally abundant, especially along the rougher valley margins; in sandy localities, they have replaced the original bluestem grass destroyed by drought and overgrazing. Where seepage and springs result in live water, the creek banks have scattering stands of hackberry, cottonwood, and willow, with occasionally some elm, green ash, and box elder.[2] Around the springs and in shaded rocky places, poison ivy flourishes. Thickets of wild plum, along with some elderberry, chokecherry, and other shrubs bearing edible fruits grow in the ravines and along the creeks. The native fauna, if somewhat less varied than farther east, was nevertheless formerly abundant. The grassy uplands supported large numbers of bison and pronghorn antelope, and these in turn were preyed upon by prairie wolves. Present also were white-tailed and mule deer, Plains grizzly, coyote, swift fox, black-footed ferret, badger, prairie dog, white-tailed and black-tailed jackrabbit, western cottontail, and numerous smaller rodents. Beaver, raccoon, and apparently elk, occurred. Bird life included a variety of small ground-nesting species, along with such larger forms as bald eagle, raven, crow, various hawks and owls, sharp-tailed grouse, and prairie chicken. Ducks and geese may have been obtainable from time to time as seasonal migrants. The coyote and many of the smaller mammals can still be found here; the larger carnivores and the ruminants have long since been exterminated.

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[2] The character of the tree growth in the western plains has been discussed at some length by Kellogg (1905). With reference to western Kansas, he makes the following observations (Kellogg, 1905, pp. 23–24): "The valley type of forest is confined entirely to the valleys of watercourses and draws or their adjacent bluffs, and consists wholly of broadleaf species, with the exception of a few individuals or of small areas of red cedar. No body of timber of this type is known to grow on the uplands of western Kansas and Nebraska, though scattering trees are often found in the heads of draws almost to the upland level. In the valleys there are occasionally areas of a few acres in extent on which true forest conditions prevail, but the general form is that of a narrow belt of trees a few rods in width, holding closely to the banks of a stream or the bottom of a draw. . . .

"The trees generally are low, with spreading crowns, though dense stands sometimes occur in moist situations which produce good, clear trunks. Cottonwoods may attain a height of 75 feet, but the maximum height of the other species is in the neighborhood of 50 feet, while many mature trees do not grow even that high. Diameters, too, are mostly small, except in the case of cottonwood, which frequently attains a diameter of 3 to 4 feet, and sometimes over 5 feet. A green ash at Hays, Kans., is 44 inches in diameter 2 feet above ground, and a white elm on Eagle Creek, near Paradise, is 62 inches in diameter at breastheight, but these are exceptional cases. Aside from the cottonwoods, the average diameter of the broadleaf species of western Kansas and Nebraska is probably not far from 6 inches.

"The Cimarron, Arkansas, Smoky Hill, Republican, and Platte rivers are preeminently sandy streams with shifting beds, so that timber growth is either wholly absent from them over long stretches or consists only of scattering cottonwoods and willows. As previously mentioned, the smaller streams which are less sandy support other species, principally green ash, white elm, hackberry, and box elder.

"In Kansas, as far west as the 100th meridian, nearly every stream has its fringe of timber, and there is considerable diversity in species; but both the quantity and variety decrease westward, until at the Colorado line timber is very scarce, and occurs mainly on the Smoky Hill and Arkansas rivers. Along the tributaries of the former stream, in Russell County, near the center of the State, there are found cottonwood, willow, red and white elm, black walnut, burr oak, hackberry, box elder, green ash, red cedar, red mulberry, and wild china; while in Wallace County, on the western border, there are only a few groves of cottonwood and willow. The best westward extension of timber in Kansas is on Beaver Creek, in Rawlins County. The creek is bordered by a thriving growth of green ash, with a lesser number of several other species. The timber reaches to some distance above Atwood, not far from the point where the bed of the stream first carries permanent water."

In terms of human occupancy, the High Plains are a region of limited possibilities. They have a low and variable precipitation, averaging between 15 and 22 inches annually. There is an abundance of sunshine, along with strong southerly (and therefore, drying) summer winds and a high rate of evaporation. Soils are generally light and fine-textured, and tend to blow readily when the vegetative cover is destroyed. West of the 100th meridian, grain-farming on the uplands is likely to be precarious if water is not available to supplement the rainfall in dry years. Much of the region is given over to stock-raising. The population is much sparser than in regions to the east. Ethnohistorical and archeological evidence suggests that in the past, as also during the 1800's, hunting economies were more likely to succeed here than horticultural; but it is equally clear that where, or when, conditions were at all favorable, native farming peoples were present. We shall return to this matter again.

In marked contrast is the Plains Border or Dissected High Plains region to the east. It comprises somewhat less than the central third of the State. North of the Arkansas, the eastern front of the High Plains has been irregularly and deeply dissected by stream erosion to produce a broken landscape of high plateaulike uplands, prominent and often sharply indented east-facing sandstone or limestone escarpments, conspicuous headlands, isolated buttes, hills, and rolling lowland plains. The eastern part consists of the Smoky Hills, carved mainly in the Dakota sandstone; to the west are the Blue Hills, consisting chiefly of limestones and shales. The lower Republican, Solomon, Saline, and Smoky Hill Rivers flow in a general easterly or southeasterly direction across this belt. Characteristically, they have flat-floored, bluff-lined valleys as much as 200 feet deep, but seldom exceeding 2 or 3 miles in width; and in this region, they usually carry water throughout the year. Numerous spring-fed tributaries indent the valley margins; and, like the main streams, their courses are commonly terrace lined. The bottom-land soils are usually deep, well drained, and fertile; their corn-producing capacity is limited only by the amount of rainfall they receive. Near Concordia and Minneapolis, respectively in the drainage of the Republican and the Solomon, salt marshes and springs impart a brackish quality to the creeks which drain them; and the Saline River to the south is reputed to be one of the saltiest streams in the United States. Near Cawker City, on the Solomon, is the famous mineral spring still known by its Indian name, Waconda or Great Spirit Spring (McCoy, 1840, p. 411; Grinnell, 1893, p. 358; Patrick, 1906). All of these derive their mineral content from the saliferous shales of the Dakota sandstone.

South of the Smoky Hill River, the escarpments turn westward and fade away in the general level of the High Plains. To the south is the Great Bend Lowland, a broad flat to rolling plain representing a local base-level of the Arkansas River. It includes the roughly triangular area lying within the great bend of the Arkansas between Dodge City and Wichita, as well as the nearly flat land northeast of the river around McPherson and Newton. In this latter area and on the north side of the Arkansas, alluvial and terrace deposits predominate with a belt of dune sands north and east of Hutchinson. South of the river is a poorly drained area of sand dunes and sandy plains, among which are found salt marshes, ponds, and sloughs. To the southeast, the sandy soils give way to "hard lands" and alluvial belts with greater agricultural potential. Tributaries of the Arkansas in this section include Pawnee River, Walnut Creek, Cow Creek, and Little Arkansas River, all entering on the left, or north, bank. These generally have firm banks, wide fertile bottoms, a dependable flow of water, and more or less hardwood timber. On the right, or south, bank the Arkansas is joined by Rattlesnake and other small creeks emptying their brackish waters into the main stream above Hutchinson; and by Ninnescah River, Bluff Creek, and the Chikaskia River farther to the south.

South of the Great Bend Lowland, the High Plains thrust a long narrow tongue far to the eastward. Beyond this is a deeply eroded belt, 10 to 20 miles wide and extending nearly 100 miles along the southern edge of the State. Variously known as the Red Hills or the Cimarron Breaks, this zone owes its ruggedness to the erosive action of south-flowing tributaries of the Medicine Lodge and Cimarron

Rivers on soft Permian formations. Red shales and sandstones overlain by gypsum beds have been carved into terraced canyons, bold headlands, isolated buttes, cones, and pinnacles. Always a colorful and picturesque landscape, it becomes one of striking beauty when seen in the light of early morning.

Along with the greater topographic diversity of this central Kansas section, as compared with the High Plains, there are climatic and biotic differences that have influenced man's activities. Originally, this was a mixed bluestem and short-grass region. On the drier uplands and thinner soils, buffalo and grama grasses predominated; the bottoms and slopes were occupied by little bluestem and other prairie grasses, decreasing toward the west as growing conditions became less favorable. Western wheatgrass which, like the short grasses, cures without cutting into an excellent winter forage, grew in the heavier bottomland soils. North of the Arkansas, the principal streams were fringed with hardwoods, and strips of timber evidently grew along most of their perennial tributaries as well. Unlike the scattering and spotty tree growth in the High Plains valleys, these belts of woodland were more or less continuous, and they became heavier toward the east, that is downstream. They consisted of cottonwood, willow, ash, elm, and bur oak, and may have included some walnut also. Here, too, there were chokecherries, wild currants, gooseberries, plums, and grapes. Farther south, the Little Arkansas appears to have been about the western limit of fairly heavy tree growth, although patches of woodland and scattering trees were undoubtedly to be found along Cow Creek, Walnut Creek, and on Pawnee River. The low grass-grown banks of the Arkansas above the Little Arkansas seem to have been largely treeless except for occasional cottonwoods; and this was probably true of most of the region west and south of the main stream. Native game included virtually all the forms enumerated above for the High Plains; but the increased cover along the watercourses and the more deeply grassed prairies undoubtedly supported greater numbers of elk, deer, black bear, beaver, otter, and wildcat. Tree squirrels, porcupine, and cougar can probably be added to this list. In the timber there was a plentiful and varied bird life, including a host of songbirds as well as quail and wild turkey. Prairie chicken and grouse were plentiful throughout this section. In marshy areas, on the sandhill lakes and ponds, and along the larger streams, various water and shore birds had their habitats, and ducks and geese could be taken in season. For peoples wholly or primarily on a hunting and gathering subsistence economy, this region could furnish an abundance of food; and to a thin and scattered population, afoot and relying largely on noncommunal methods, the timbered valleys and broken terrain would probably have afforded better hunting than the open

High Plains country. Moreover, there is here an increased and surer yearly precipitation, averaging from 22 to 30 inches or more; and this, added to fertile valley bottoms, relatively plentiful wood for fuel and building, water, and convenient flood-free terraces well suited for village locations, made the region an attractive one for native, as for the later white, farming peoples.

Eastward again, the Osage Plains are characterized by a succession of irregular east-facing limestone escarpments, 50 to more than 200 feet high, which trend northeast-southwest across the State. The formations composing these escarpments, mainly of Pennsylvanian age, dip slightly toward the west and are separated from one another by less resistant strata of shale on which have been developed flat to gently rolling plains. Westernmost of the successive scarped uplands, and the most prominent, is that known as the Flint Hills. Here the protecting strata are Permian limestones, many of which contain an abundance of chert, and the gently rolling upland surface is often littered with fragments and nodules of "flint." The irregular eastern edge of the Flint Hills upland generally follows the meridian of 96°30′ west longitude; its maximum elevation approximates 1,500 feet south of Cottonwood River, dropping to about 1,300 feet north of Kansas River, where the hills lose much of their distinctive and conspicuous character. On the west, the upland surface merges with the flat plains along the Arkansas River.

The Osage Plains are the most generously watered portion of the State, with annual precipitation averaging generally in excess of 30 inches. Along their northern margin, drainage is by a series of short perennial creeks into Kansas River, which traverses the Flint Hills and then skirts the region to the east in a well-defined bluff-bordered and terraced valley up to 200 feet deep. Farther south, numerous spring-fed creeks give rise to several permanent rivers. The Marais des Cygnes (Osage) courses generally eastward, roughly paralleling the lower Kansas, to join the Missouri beyond the border of the State. The Neosho and its principal affluent, the Cottonwood, head in the Flint Hills upland and flow southeast to join the Arkansas in eastern Oklahoma. Paralleling the Neosho to the west is the Verdigris, with Elk and Fall Rivers as its main tributaries, and uniting with the Arkansas a few hundred feet above the Neosho. The Walnut rises on the west, or back, slope of the Flint Hills and empties into the Arkansas a few miles above its point of exit from the State. All of these streams run in wide, flat-floored valleys with high bordering bluffs, terraces, and alluvial bottoms; where they cut through the escarpments, the channels are often deep, narrow, and lined with rocky ledges or cliffs. All are subject to major floods that often overspread the valley bottoms; and the bottom-land soils are typically heavy, though fairly productive. In dry years the Neosho and Verdigris particularly carry little water during the summer.

In their original state, the Osage Plains were primarily a tall grass prairie, with big bluestem dominating the rolling plains between streams and much of the valley bottoms as well. The immediate stream banks and adjacent valley floors were heavily timbered with oak, black walnut, elm, linden, sycamore, locust, hickory, pecan, and other hardwoods. Smaller forms that undoubtedly entered into the native economy of the Indians included Osage orange or bois d'arc, persimmon, papaw, elderberry, serviceberry, chokecherry, and wild grape. The forested belts and nearby prairies provided shelter and food for an abundant mammalian fauna, chief among which were elk, white-tailed and mule deer, black bear, cougar, wildcat, timber wolf, gray and red fox, raccoon, opossum, the gray, fox, and flying squirrels, beaver, otter, muskrat, and cottontail rabbit. On the prairies were bison, coyote, antelope, jackrabbit, badger, and many smaller mammals. Among the numerous birds, the plentiful wild turkey was doubtless of primary importance to man; but prairie chicken, ruffed grouse, and quail were also useful, and the passenger pigeon and Carolina parakeet were present. The larger streams, usually running clear and unsilted, yielded an abundance of edible fish and shellfish.

With the advent of the white man and clearing of much of the forest and bluestem cover, the larger mammals have vanished, leaving only the smaller fur-bearers. The fertile bottom lands and prairies, combined with plentiful rainfall, today produce heavy yields of corn and other crops. The shallower upland soils to the west, as in the Flint Hills district, are much less suitable for crop production; but the grass cover of this famous "Bluestem Region," superficially reminiscent in a dry year of the High Plains, annually fattens thousands of Texas and New Mexico cattle for midwestern stockyards.

In the Dissected Till Plains north of Kansas River, whose course from Manhattan eastward represents the approximate southern limit of the Kansan ice sheet, the older scarped terrain of the Osage Plains has been largely obscured by a mantle of glacial drift and loess. The gently rounded and smoothed upland surface merges northward into the loess plains of Nebraska and Iowa. In Kansas, the drift is relatively thin, and extends only to a line just south of, and roughly paralleling, the Kansas River. However, it contains many boulders of transported materials, some of which are otherwise absent from the State. These include much pink to purplish Sioux quartzite from southwestern Minnesota and northwestern Iowa, as well as granites, diorites, diabases, gabbros, and greenstones. As we shall see, some of these were evidently drawn upon by the Indians for manufacture of axes, hammers, and other heavy-duty implements. The loess mantle varies in thickness from 10 feet on the west to nearly 100 feet along the Missouri River bluffs. The Missouri flows in a relatively narrow alluvium-filled trough 2 to 4 miles wide, with well-wooded bottoms bordered by prominent loess-capped limestone and shale bluffs. Before its stabilization by means of dikes, revetments, and piling, the channel shifted frequently, leaving oxbow lakes, sloughs, and marshes along the old courses. Creeks and ravines joining it from the west are usually short, deeply incised, and heavily wooded; they are numerous and have resulted in a very rough broken strip usually extending some distance back from the main valley. The Blue River, at or near the western edge of the till plains, likewise has a deep, narrow, flat-floored valley; and this, like the well-defined valleys of the Vermillion, Delaware, and Wolf Rivers and the innumerable smaller creeks, was formerly well timbered. The loessial soils throughout this section are among the finest in the State for corn and other crops, which flourish on uplands and alluvial bottom lands alike. Native floral and faunal assemblages closely paralleled those in the Osage Plains to the south. These two sections are today the most heavily populated portion of Kansas.

With regard to climate, Kansas generally is characterized by warm summers with abundant sunshine, cold dry winters, strong wind movement, and wide variations in temperature and precipitation (Flora, 1948). The mean annual temperature for the State is 55° F., with extreme thermometer readings of 121° and −40°. The daily range, which is especially marked in the western part, may be as much as 40° to 50°. The heat of the summer days is alleviated by low relative humidity and, in western Kansas, by pleasantly cool nights. During the summer, shade temperatures sometimes exceed 100° for several consecutive days with night readings then seldom dropping below 75° or 80°; and these periods are often accompanied by hot winds whose drying effects cause great discomfort to man and animals and heavy loss to crops, especially to corn in the tasseling stage. Winds vary from 8 to 16 miles per hour, generally being strongest in the afternoons and the highest velocities occurring in the west; they blow mostly from the south. Average annual precipitation varies widely from slightly over 40 inches in the southeast corner to less than 16 inches along the western border. This comes mostly as rain, varying from widespread cyclonic storms to localized thundershowers that may be of such great violence and short duration as to leave little moisture in the ground on which they fall. Snowfall is not great, and it seldom covers the ground for more than a few days at a time. Owing to the dry winters, soil moisture is generally rather limited, so that crops and other vegetation must depend mainly on spring and summer rainfall. In this respect, the climate is favorable, since 70 to 75 percent of the annual precipitation falls from April to September, when it is most urgently needed. A frost-free growing season averaging from 150 days in the northwest to nearly 200 days in the southeast is ample for maturing of most field and garden crops.

Since much of the archeological evidence with which we shall be concerned in later pages relates to people relying in part on corngrowing, certain aspects of Kansas geography deserve further consideration. From what has already been said, it should be obvious that the region is one of varying agricultural possibilities (Kans. St. Bd. Agr., 1929, pp. 11–20, 153–157). In the eastern stream valleys, a sufficiency of rain, good soils with subsurface moisture throughout much or most of the year, and favorable conditions generally offer a setting comparable to that in neighboring Corn-Belt States of the central Mississippi valley. Westward, however, as rainfall diminishes, evaporation increases, and the soils become drier, the Great Plains environment is progressively less favorable. Here, although the soils are still of great fertility, the climatic factor becomes a critical one for the corngrower, and doubly so where he lacks the technological advantages of the highly specialized methods and crops of the present-day farmer. The western limit of successful corngrowing corresponds approximately with the line of 20-inch annual precipitation—or, perhaps more accurately, with the line of 8-inch June-to-August rainfall (Jenkins, 1941). Normally, these lines lie not far apart in western Kansas, near or just beyond the 100th meridian. Over the years, however, they fluctuate widely and unpredictably (fig. 3). In 1915, the wettest year on record in Kansas, the 20-inch isohyet lay in eastern Colorado; the western tier of counties in Kansas received from 23 to 32 inches of rain while some of the eastern counties had up to 60 inches. In 1936, driest year on record, precipitation along the Kansas-Colorado line dropped to 10 inches and few counties west of the Flint Hills received as much as 20 inches (Flora, 1948, pp. 31–32). Stated in another way, wet years may produce over portions of Kansas a climate normally characteristic of Iowa and western Illinois; in dry years, parts of the region approach the aridity of a desert (Thornthwaite, 1941). The western half, thus, lies in a region where the all-important rainfall varies widely both above and below a barely adequate average; and in more than half the years for which records are available, the deviation from the average has been below rather than above. Added to this are the excessively high temperatures and hot searing winds that usually accompany droughts here; they may be even more damaging to the corn crop than the decline in precipitation. That these climatic

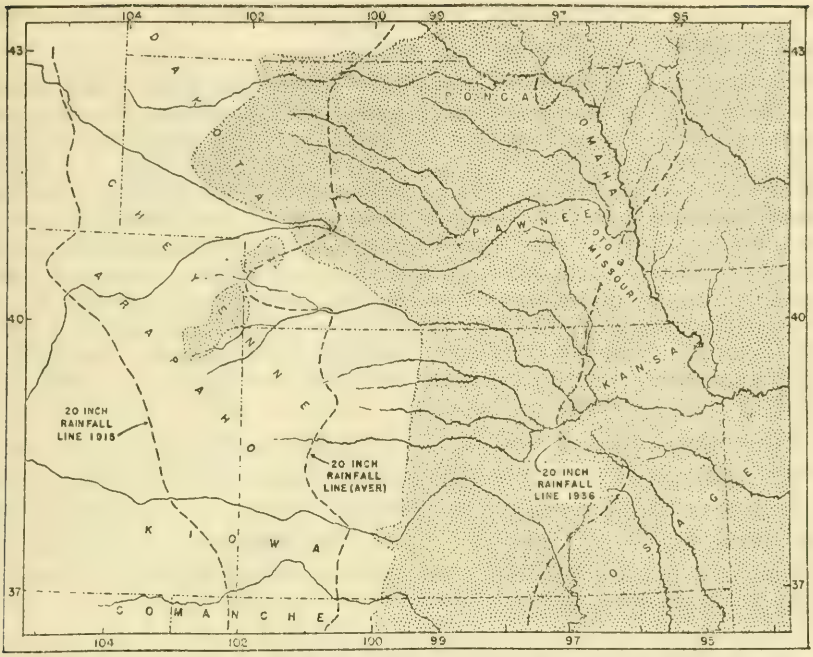
104
102
100
99
97
95
43
40
37
DAKOTA
PONCA
OMAHA
PAWNEE
OTO
MISSOURI
CHEYENNE
ARAPAHO
KANSA
OSAGE
KIOWA
COMANCHE
20 INCH RAINFALL LINE 1915
20 INCH RAINFALL LINE (AVER)
20 INCH RAINFALL LINE 1936

FIGURE 3.—The Central Plains, showing historic tribal locations as of approximately 1825; shifting rainfall averages; and major grassland divisions. Stippling, tall grass prairies; unstippled, short grass plains. (Courtesy American Anthropologist.)

vagaries, perhaps further complicated by dust storms and insect infestations, probably adversely affected the native populations, as we know they did the early white settlers in western Kansas, will be pointed out after we have considered the archeological data (see also Wedel, 1953 a).

For the State as a whole, it should be remembered that Kansas, like Nebraska, lies well within the former range of the great bison herds; and the presence of this once abundant food resource was, of course, a factor of primary importance in the aboriginal utilization of its grassy plains and broad river valleys. From the earliest Spanish explorations through the 18th century, as doubtless long before, these animals ranged generally throughout the length and breadth of the State. Whatever their actual numbers and habits, to the Indians residing in and near the area, they must have appeared as a well-nigh inexhaustible food supply. By the 19th century, however, as game east of the Missouri vanished before the food and fur hunter, the tribes there resident turned increasingly to the trans-Missouri plains on their hunts. Still other tribes assigned to reservations west of the Missouri added to the slaughter after 1825, so that the receding herds were to be found mainly west of the longitude of the great bend of the Arkansas, in the short-grass belt. In 1873, Mudge observed (Allen, 1876, p. 147) that—

> The buffalo ranged to the eastern border of Kansas as recently as 1835. About that time the United States authorities removed the Delaware, Pottawattamie, Kaws, and other tribes of Indians to "Reservations" in the eastern part of what is now Kansas. These Indians soon drove the buffalo as far west as the Blue River (one hundred miles west of the Missouri River), which was as far as the reservations extended. The buffalo held that range till 1854, when Kansas was made a Territory and whites began to settle here. For fifteen years from that time the buffalo receded, on an average, about ten miles a year. For three years past they have been hunted in summer for their hides for tanning; this is exterminating them very rapidly. Now they are not found in northern Kansas east of 100° of longitude; in Southern Kansas as far easterly as longitude 98°, the western boundary of Kansas being 102°. In a few years I think they will not range north of the Arkansas River.

With construction of the Union Pacific Railroad along the overland route up the Platte valley in 1868, the bison were split into what came to be known as the northern and southern herds. To the documentation given by Strong (1935, pp. 36–37) regarding the last decades of the bison in the Nebraska-Kansas region, we may add the following from Dodge (1877, p. 131):

> In 1870 the original great buffalo range had become permanently divided into two ranges. The Southern buffalo ranged from Northern Texas to about lat. 41°30′. The Northern ranged from about lat. 43°, through what is known as the Powder River country, into the British possessions. Of the numbers and position of the Northern Buffalo but little is known.
>
> We will see what has come to the Southern.
>
> Their range was as described above, but their most prized feeding ground was that section of country between the South Platte and Arkansas rivers, watered by the Republican, Smoky, Walmit [Walnut], Pawnee, and other parallel or tributary streams, and generally known as the Republican country. Hundreds of thousands went south from here each winter, but hundreds of thousands remained. It was the chosen home of the buffalo.

The split between the two great herds was quickly widened, with construction of the Kansas Pacific and the Atchison, Topeka, and Santa Fe Railroads across western Kansas. The railroads laid the groundwork for the commercial hunter and his bloody work; and within a decade of Dodge's writing, these hunters had practically exterminated the southern herd, except for a few thousand head which found temporary refuge in the Indian country south of the Cimarron. The story of this slaughter has been adequately set forth by others (Allen, 1876, esp. pp. 177-180; Dodge, 1877; Hornaday, 1889; Roe, 1951). Its effects on the Indians who for so long had drawn much of their sustenance from the bison are vividly recorded in the reports of the Commissioners of Indian Affairs during this period, and in other contemporary documents.

## THE HISTORICAL BACKGROUND

High on the list of objectives set in formulation of the field program here being reported was the identification and definition, wherever possible, of the material remains left by the principal historic tribes of the Kansas region. Here, as elsewhere in the Plains area, the older Indian occupation and the more recent one of his white successor overlapped through some centuries of time, and the archeological record merges into that of written history and ethnography. This being so, an obvious avenue of attack was what has come to be known as the direct-historic approach. As I have elsewhere indicated (Wedel, 1938 c, p. 1), this approach involves two basic steps: (1) the isolation and definition of the archeological criteria characterizing specific tribal groups, whereby some or many sites could theoretically be removed from the category of unknowns, and (2) comparison of the materials so identified with earlier remains and the establishment thus of a time and culture sequence extending from the known historic to the unknown prehistoric. For some years, of course, this method has been applied with conspicuous success in Nebraska and Plains prehistory, as also elsewhere; but ample opportunity remains for further fruitful application throughout much of the central United States.

For various reasons, achievement in Kansas fell considerably short of anticipation; and the final results of the three-season program here presented give a picture based only in part on historic sites archeology. Since I am convinced, nevertheless, of the basic soundness of the procedure wherever it is applicable, and believe it deserving of further trial in Kansas, it seems worth while to review in some detail the history of white exploration as it relates to the native peoples formerly resident here. Others, perhaps, will find it feasible to carry on where the National Museum cannot.

Documentary information on the Indians of the Kansas region comes from a variety of sources, mainly Spanish, French, and American. These sources involve narratives of explorations, memoirs of various sorts, letters and reports, and maps. Spanish sources are earliest, beginning with reports of explorations before the middle of the 16th century and continuing intermittently for nearly 200 years. They relate usually, and often only incidentally, to the western parts of the region, nearest the Spanish theater of operations on the upper Rio Grande. Beginning in the last half of the 17th century and more than a hundred years after the initial Spanish explorations, the French appeared on the scene—first, as missionaries and explorers from the Great Lakes area, and later as traders among the Indians of the lower Mississippi and Missouri valleys striving to locate nonexistent mines and to establish commerce with the Spanish in New Mexico. Frenchmen continued to carry on in the regions even after the transfer of

French political control in Louisiana to the Spanish in the 1760's. French records, as well as many of those left us by the Spanish, are often very brief and tantalizingly inadequate; and their interpretation in terms of modern geography is seldom easy. With American acquisition of the Louisiana territory in 1803 and the launching of a series of official exploring ventures and of Indian agency reports, much fuller and more precise information on the Indians becomes available.

The earliest accounts of Indians in the region of present Kansas appear in the narratives of the Coronado expedition (Hammond and Rey, 1940; Winship, 1896), and thus date from just before the middle of the 16th century. These narratives have been variously interpreted for many years, and have given rise to a voluminous literature; but recently adduced historical and archeological evidence (see Jones, 1929, 1937; Wedel, 1942; Bolton, 1949, and references cited therein) permits fairly precise conclusions as to the route followed and the destination finally reached by the Spanish. Since these accounts are based largely on eyewitness observations, rather than on hearsay, and because they afford us a glimpse of the country traversed and of the native ways of life completely uninfluenced by previous white contact, direct or indirect, they are of first importance.

Leaving Pecos in the spring of 1541 and guided by two captive Plains Indians whose homes were east and northeast of that town, Coronado led his army eastward into the Texas Panhandle country. En route, he met wandering bands of tipi-using, bison-hunting Indians whom he called "Querechos" and "Teyas," evidently Plains Apache. At the eastern edge of the Llano Estacado, at or near Palo Duro Canyon, the army was sent back to the Rio Grande pueblos while Coronado and a picked detachment of 30 horsemen (and six foot soldiers?) turned northward. Marching "by the needle," this party traveled, says Coronado, "forty-two days . . . living all this while solely on the flesh of the bulls and cows . . . going many days without water, and cooking the food with cow dung, because there is not any kind of wood in all these plains, away from the gullies and rivers, which are very few . . .".

The Coronado party probably entered present Kansas in the vicinity of Liberal, shortly after the middle of June. On Wednesday, June 29, "the feast day of Saints Peter and Paul," Coronado reached the "river Quivira"—the Arkansas near the present town of Ford just above the beginning of the great northward bend of the stream. Here the Spaniards turned northeast and downstream. In 3 days, between present Kinsley and Larned, they met a small hunting party—the first Indians mentioned since Coronado's departure from the barrancas where he left the army. Three or four days later, after rounding the northernmost point of the bend and leaving the river, they found the first of the settlements of Quivira. Here, in what is now Rice and McPherson Counties, they spent nearly a month, visiting the various rancherias—"not more than 25 villages of straw houses," says Coronado—scattered north and east of the great bend between the Arkansas and Smoky Hill Rivers. Unlike the Querechos and Teyas, wrote Coronado, the natives of Quivira "have the advantage in the houses they build and in planting corn." The Spaniards were favorably impressed with the land generally, which, by comparison with the High Plains terrain through which they had journeyed so long, seemed well-watered and productive; but the villages of grass houses, the corn, beans, and melons growing nearby, and the Indians generally were a great disappointment. In mid-August, having satisfied themselves concerning the lack of treasure in the region and with guides provided by the natives, the Spaniards retraced their course to the Arkansas River crossing and then headed by a more direct and shorter route back to the Canadian River and on to Pecos. In the following year, apparently, Father Juan de Padilla returned to Quivira to bring the gospel to its inhabitants, only to lose his life after some months. Thereafter, a half century was to elapse before white men again viewed the settlements of Quivira.

Concerning the next Spanish visit to the region we know almost nothing. This was an unauthorized expedition under Francisco Leyva de Bonilla and Antonio Gutierrez de Humaña. It proceeded, in 1593 or 1594, from San Ildefonso on the Rio Grande northeastward into the Plains. On a stream identified by Bolton (1916, p. 201) as the Arkansas, the Spaniards found a large rancheria where the houses were of grass and the natives grew bountiful crops. Thence they marched northward an undetermined distance for 12 days to another stream, which Bolton suggests may have been the Platte; I suspect it was the Smoky Hill or Kansas. Here quarrels between the leaders resulted in the murder of Bonilla; and subsequently, the entire command, with the exception of its Indian guide, was destroyed by the Indians of the region.

A few years later, in the summer of 1601, Don Juan de Oñate led a large expedition consisting of soldiers, missionaries, and others eastward from the Rio Grande into the buffalo plains (Bolton, 1916). Oñate left San Gabriel, between Santa Clara pueblo and the mouth of the Chama River, on June 23. He crossed the Pecos and Gallinas Rivers and then descended the Canadian, where he met several bands of Apaches Vaqueros. Leaving the river because of sand dunes 110 leagues from San Gabriel, he moved north and east along an uncertain route. Finally, at more than 200 leagues (ca. 500 miles) from San Gabriel, he encountered a large rancheria of Escanjaques, a nomadic bison-hunting people who dwelt in skin lodges, practiced tattooing or body painting, and were led by chiefs who had little authority. The Escanjaques guided the Spaniards to a large settlement ("gran poblacion") about 12 leagues farther on where, they alleged, members of the Humaña party had been slain.

Fording a large east-flowing river, the Spaniards found a great rancheria consisting of groups of grass lodges scattered along the banks of a small river joining the larger one from the north. Among the lodges were patches of maize, beans, and calabashes. The natives had metates and made clay pottery, and the men were streaked with paint (or tattooed?) on the face. Other settlements of the same people occurred farther up the stream. Oñate nowhere gives these people a name; but in the testimony given in Mexico City in 1602 by members of the expedition, it is stated that the Indians of San Gabriel, that is, the pueblo Indians, " . . . name the Indians of the poblacion the Jumanes because all the *Rayados* (painted or tattooed Indians) are called thus . . . " (Scholes and Mera, 1940, p. 274). Outbreak of hostilities between the grass-house people and the Escanjaques accompanying Oñate led him to discontinue his exploration and turn back, the expedition arriving at San Gabriel on November 24. Soon thereafter, it appears, a delegation of Indians from the grass house settlements appeared before Oñate to request his aid in their struggles with the Escanjaques (Thomas, 1935, pp. 8–9).

Bolton (1916, p. 260) suggests that the gran poblacion visited by Oñate was either on Cow Creek or on the Little Arkansas; and Scholes (Scholes and Mera, 1940, p. 274) comments that it "was undoubtedly a Quivira settlement, located in the same region as the Quiviras whom Coronado visited in 1541. The distance recorded for Coronado's return trip in 1541 compares with the estimated number of leagues traveled by Oñate 60 years later. Moreover, the descriptions of house types and other phases of material culture are essentially the same in each case." I have elsewhere (Wedel, 1942, pp. 18–20) suggested that the correct location is perhaps at the confluence of the Walnut River with the Arkansas in present Cowley County, Kans. This location, which I still regard as a possible one, has its difficulties, however, since there seems to be no arrangement of streams to the southwest such as is described by Oñate. If his gran poblacion was on the lower Little Arkansas, perhaps somewhere in the vicinity of present Wichita, the approach would have been across the Chikaskia and Ninnescah Rivers and several smaller streams. In this case, the Escanjaque rancheria may have been somewhere in present Harper or Sumner Counties. In any case, it would seem fairly improbable that the earlier Humaña party in its 12 days northward march got far beyond the Smoky Hill river. The Escanjaques were almost certainly living somewhere in south-central Kansas or northern Oklahoma, along some stream not far west of, and tributary to, the Arkansas.

In the half a century following Oñate's return from the Arkansas, there appears to have been little or no direct contact between the Spanish on the Rio Grande, busy with their exploitation and proselytizing of the Pueblos, and the Indians of the present Kansas region. In that time, however, the Spanish learned more about the various Apache tribes or bands by whom they were surrounded. Here we are interested only in the Apaches Vaqueros to the east of the New Mexican settlements. These Apaches ranged, according to Benavides, more than 150 leagues along the boundary of New Mexico, and extended more than 100 leagues toward the east. Like the Querechos seen by Coronado, the Vaqueros lived solely on the bison, dwelling in skin tents, apparently using the travois, and trading the products of the chase to the Pueblos or to the Indians of Quivira. Despite these trade contacts and the practice of wintering near the settled Indians, it is obvious that the Apaches were not regarded as friendly. The documents tell us, in fact, that they raided the Pueblos as much as they traded with them. There is no mention of corn-growing among the eastern Apache, that is, the Vaquero, although the Apache de Navaho to the north and northwest were described as good farmers.[3]

Apache raids on the Pueblos and Spaniards of the Rio Grande became increasingly serious after the mid-17th century. Stimulated to these attacks by drought and food shortages (Scholes, 1930) and encouraged by Spanish dissension and inefficiency, the Apache evidently contributed to the growing unrest that culminated in the Pueblo Revolt of 1680. In the general disquiet preceding that event, apparently some time after 1664, several families of Taos fled to the buffalo plains and established themselves in a fortified spot "which since on this account they call El Cuartelejo" (Thomas, 1935, p. 53). Here they remained, among the Apache, until Juan de Archuleta, at the governor's order, brought them back to the Rio Grande, sometime before 1680. Few details of this expedition are available, and there is nothing from which the location of the "fortified spot" can be certainly determined. It is of interest, however, to note that the fugitives were found in possession of "kettles and other pieces of copper and tin . . ." which they said they had obtained "from the Quivira pueblos, to which they made a journey from El Cuartelejo." The Spaniards were informed also that from El Cuartelejo it was possible to travel by way of Quivira to the Pawnees, with whom the French were said to be trading.

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[3] Ayer, 1916. The information and specific designations by Benavides, who served in New Mexico from 1622 into the 1630's, were used by Nicholas Sanson on his map "Amerique Septentrionale," dated 1650. The terminology and general delineation were copied by other map makers. They may be noted on Guillaume Delisle's maps as late as 1703 (Carte du Mexique et du Mississippi), although the Rio del Norte and adjacent towns and tribes become more condensed and are pulled farther to the west.

Following subjugation of the Pueblos after the revolt, the Spanish again found themselves under the necessity of sending out military forces in pursuit of fugitive Pueblo Indians who had sought refuge in the Plains. Among these were a group of Picuries said to have been living among the Apache since 1696. Seeking them, Ulibarri in 1706 led a party of soldiers, colonials, and Indians northward from Santa Fe via Taos to the Arkansas. En route, he noted several tribes or bands of Apache practicing maize agriculture; and, as a portent of things to come, he learned also of the fear these people had of an attack by the Ute and Comanche, the latter tribe in this year making its first documented appearance in history. Crossing the Arkansas somewhere east of present Pueblo, Colo., the expedition traveled eastward parallel to, and a few miles north of, the stream. The Cuartelejo Apache were met ". . . approximately in present Otero or Kiowa County, Colorado . . . probably [near] the junction of Mustang and Adobe creeks . . ." (Thomas, 1935, p. 264). Here and from neighboring rancherias, the Spanish gathered up 62 Picuries, but apparently left behind some other Pueblo Indians who were away with Apache hunting parties. Further news was acquired about attacks by the Pawnee, reportedly aided by some French, on the Apache rancherias to the north.

Thirteen years later, in 1719, Governor Valverde led another force northward over much the same route in search of the Comanche and Ute who were now harrassing the settlements of New Mexico. Again there is mention of corn-growing and irrigation among the Apaches north of the Rio Grande, as well as statements that the Ute and Comanche, evidently well provided with horses (Thomas, 1935, p. 127), were creating serious disturbances among these peaceful peoples. Valverde never caught up with his quarry, but he met again the Apaches of El Cuartelejo. They are said to have "numbered more than 200 tents, and more than 300 Indians under arms. Together with the crowd of women and children there were probably more than 1000 persons . . ." Visiting their camp, the Spaniards noted "the dogs, on which were loaded the poles for tents and other utensils they used." As with Ulibarri, there is no mention of horses among these people; but they appear to have been growers of maize, beans, and pumpkins. Moreover, among them there was a Paloma Apache from "the most remote borderlands of the Apaches . . ." who bore a gunshot wound inflicted when the French, allied with the Pawnee and Jumanos [Wichita?], attacked his people from ambush while they were planting corn (Thomas, 1935, p. 132). The Paloma Apache had relinquished their lands to the north as a result of these attacks, and were moving nearer the southerly Apache groups.

The Cuartelejo Apache are mentioned again in the following year, in connection with the ill-fated Villazur expedition. Dispatched by Valverde to determine the location of the French, Villazur stopped at El Cuartelejo on his way to the Pawnee country and apparently reinforced his party with some of the friendly Apache. Fifty leagues beyond, the command was dealt a crushing defeat by the Pawnee, supposedly aided by the French, and three-fourths of the Spanish were destroyed. This seems to have ended serious exploration by the Spanish toward the northeast, though they continued to get word from the Apache concerning events at El Cuartelejo. In 1727, a group of Paloma and Escalchufines Apache reported that six Frenchmen had come to El Cuartelejo, five of them going out with the Apache in search of the Comanches. Other Frenchmen were reported settled on the Rio de Chinali not far away. According to another report, some Frenchmen had gone "with a great force of Apaches of the nations Palomas, Cuartelejos, and Sierra Blancas to look for the Comanches (a people widely scattered because of the numerousness of their nation)." The Comanche, wrote Bustamente in 1727, "are in El Almagre [Colorado Front Range, according to Thomas, 1935, p. 283] or a little farther away."

The historical data reviewed in the past few pages are of interest as indicating the nature of the early postcontact Indian occupation of the short-grass plains between the Rio Grande and the Arkansas—and perhaps as far north as the Republican or South Platte. They suggest, in addition to roving bison hunters, the presence of semihorticultural peoples in the stream valleys of southeastern Colorado and probably as far east as western Kansas. At least one historian, following his documents closely and discounting the archeological evidence, places El Cuartelejo in eastern Colorado, where the distances and directions given in the narratives seem indeed to locate this point. Curiously enough, no archeological evidence has ever been adduced in support of this identification. This seems the more remarkable in view of the fact that Pueblo Indians on several occasions between 1664 and 1706 fled into the Plains and established themselves among the Apache at El Cuartelejo; that for at least 10 years there were more than 60 of them here (Thomas, 1935, pp. 77–78); and that these Indians seemingly erected small huts (pueblos?) apparently distinctive enough to merit comment from the Spaniards who came to rescue them (Thomas, 1935, pp. 68; 262 n. 6; 264 n. 23; 268 n. 60). In this connection, it should be noted that for nearly 60 years archeologists and historians have known of the existence in western Kansas of an indisputably puebloan structure, with irrigation works and associated remains; and, historians to the contrary (Thomas, 1935, p. 268 n. 60) notwithstanding, this structure belongs to the very period under discussion. We shall return to this interesting problem in another place; but the indubitable presence of early 18th-century puebloan remains in western Kansas is adequate justification for our somewhat detailed review of contemporary Spanish observations in the region approaching it from the west.

Of the Frenchmen who, the Apaches insisted, were allied with the Pawnee against them during the closing decades of the 17th century and shortly thereafter, there appears to be little or no direct documentation in the contemporary French accounts. It seems fairly likely, nevertheless, that adventurers and traders from the Mississippi Valley or the Great Lakes, perhaps traveling together for mutual protection, must have been among the Plains tribes some time before the explorers whose travels were recorded in documents now extant.

Just when this westward penetration began and how extensive it was there is at present no way of knowing. Such published French documents as are available concerning the Missouri Valley and the Plains in the late decades of the 17th century indicate only a vague and generalized knowledge of the region—little more, in fact, than the awareness that there were numerous and varied tribal groups there. This is apparent both in the terse lists of tribes and in the maps that resulted, directly or indirectly, from these explorations. Most of the latter are so ambiguous and confused that it is difficult or impossible to reconcile them with present-day maps of the area.

Probably our earliest French information on the Indians of the Missouri River region came from the explorations of Marquette and Jolliet, who passed the mouth of the Missouri late in June, 1673, and named the stream "la rivière Pekitanoui." No journals survive; but maps compiled by these men, and others based on their findings, give some crude indication of tribal distributions on the lower reaches of the Missouri. Their information was probably derived mostly from natives of the Illinois country. The "Pekittanoui" of the Marquette map of 1673–74 is also shown, though without name, on the "Jolliet" map of 1674 and the Randin map of 1674–81 (Tucker, 1942). Marquette shows the Osage, Missouri, Kansa, and Paniassa, in that order, westward from the head of his very short "R. Pekittanoui." On the other two maps, what is evidently the same stream is shown longer and larger; and south of it, going upstream, are successively the Missouri, Kansa (or Canssa), Osage, Pani, and another unrecognized name.

These or similar tribal names, plus some additions, appear on maps and in documents based on the discoveries of La Salle, who reached the mouth of the Missouri 9 years after Marquette and Jolliet, in February 1682. The La Salle journals and his map are now lost; but from letters and other contemporary documents, and from maps evidently based on missing originals, it is clear that La Salle had gathered a good deal of geographic information beyond that possessed by his predecessors. It is thought that he derived some, if not all, of his information on distant Missouri River tribes from a Pawnee slave. The Franquelin map of 1684,[4] showing a confused and impossible drainage pattern for the lower Missouri and its western tributaries, includes the following tribes in this general region: Missourits (Missouri), Zages (Osage), Paneassa (Wichita), Paneake, Cansa (Kansa), les Pammaha, and the Panetoca. Far to the west are the Gatacka (Kiowa Apache) and Manrhaut (Kiowa?), indicated as having horses. The Minet map of 1685 (Tucker, 1942, pl. 7), showing the same strange network of streams on the lower Missouri, has the Missouri, Paneake, Pana, Pani, and Pentoca. Farther west, beyond the Missouri River system, is the "Rio del Norte" and the "apaches de vaqueros" of the Sanson 1650 map. So far as I am aware, there are no contemporary descriptions of any of these Central Plains peoples or their ways of life and cultural characteristics. Sketchy and incomplete as the Marquette, Jolliet, and La Salle materials admittedly are, they still suggest tribal alinements not radically different from those of later times. It must be acknowledged, however, that convincing identification of some of the names appearing on these maps has not yet been made.

After the turn of the century, with the founding of a French colony at the mouth of the Mississippi and resultant intensification of activity in the Mississippi Valley, the picture steadily comes into sharper focus. For a decade or so there are only passing references to the tribes of the lower Missouri (Villiers, 1925; Nasatir, 1952, vol. 1, pp. 6–12). These, named frequently in the order of their occurrence along the stream, include the Missouri, Osage, Kansa, Oto, Iowa, and Pawnee (Panimahas, Panis, Paniassas, Panimana, Paniboucha) in the writings of Father Marest (1700), M. de Montigny (1699), Henri de Tonti (1700), Sieur d'Iberville (1702), and Father Bergier (1702). The Panioussas (Wichita) are located on the Acansa River by Diron Dartaguiette, writing in 1712; but even earlier, in 1700, Tonti (Delanglez, 1939) wrote of the Arkansas River that "The Mentons and the Paniassas are located on this river." On a sketch map using Tonti's information, the "Paniassa" are on an affluent of a river intended to be the Arkansas and their village is indicated as five "nights" from the Mentons, who in turn are five nights from one of the Arkansas Indian villages. Delanglez equates five nights with 40 leagues or 108 miles (Delanglez, 1939, p. 229).

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[4] According to Delanglez (1943, p. 60), "For all that pertains to the course of the Mississippi, its tributaries, and the Indian tribes, this map is a copy of La Salle's large map, *Some La Salle Journeys*, 34, which was re-drawn by Franquelin and Minet." See also Hamilton, 1934.

It is noted by Father Marest that the Pawnee are trafficking with the Spanish and getting horses from them. This information is duplicated for the Paniassas by Dartaguiette. Iberville commented that the Canadians were now traveling on the Mississippi and Missouri in bands of seven or eight.

That these and other activities were sharpening geographical knowledge of the region is suggested in G. Delisle's maps for the years 1700–1703, inclusive. The Rio del Norte and Apaches Vaqueros are withdrawn more to the southwest, and the western tributary system of the Mississippi expands with much detail. On the Delisle 1703 map, "Carte du Mexique et de la Floride," the Osage are shown on a branch of the "R. des Osages" and the "Cansa" are located up the Missouri on another westerly tributary termed "Metchigamiki." West of the Cansa, on the lower reaches of another upriver tributary of the Missouri are the Apana, and at its head the Paniassa. South of the Missouri, well up the "R. des Acansa," two tributaries come in from the north; on the lower are les Paniassa, on the upper les Panis.

Significant additions to contemporary knowledge of the region came from the activities of Bourgmond, who by 1714 was living in a Missouri Indian village above Grand River. In that year, Bourgmond prepared a detailed statement of distances by river from the mouth of the Missouri to the River of the Pawnees, i. e., the Platte River of Nebraska.[5] Three years later, he wrote a description of Louisiana, summarizing the location and characteristics of a number of tribes residing along the stream as far north as the Arikara. The first-hand information gathered by Bourgmond undoubtedly contributed materially to the greatly improved Delisle map of 1718 for the region. On this map (Tucker, 1942) appears, apparently for the first time, the Kansas River so designated—"Grande Riviere des Cansez"—and in approximately its correct position with reference to the bend of the Missouri River above present Kansas City. On a southwesterly tributary of this stream are "les Cansez," and on its headwaters are the Padouca. The Padouca are also shown on the upper reaches of the "Riv. des Akansas." Some distance down the "Akansas," and on a tributary flowing southward in about the longi-

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[5] In this connection it is interesting to compare certain of Bourgmond's figures here with corresponding mileages as reckoned by the Corps of Engineers along the Missouri River thalweg of 1890, thus:

| Mouth of Missouri River to— | Bourgmond (leagues) | Engineers (miles) | Bourgmond league= |
|---|---|---|---|
| | | | *Miles* |
| Osage River | 26.78 | 237.6 | 5.0 |
| Kansas River | 90.55 | 392.0 | 4.3 |
| Platte River | 155.46 | 636.9 | 4.1 |

tude of the upper Osage river are "les Paniassa 4 villages"; and the Paniassa are shown again farther down at the junction of another northerly tributary with the "Akansas." On the west (right) bank of the Missouri, just below a small westerly tributary termed "Petite Riv. des Cansez" and entering between the Kansas River and the River of the Panis, or Platte, is another village of "les Cansez."

Bourgmond returned to the Missouri in 1723 to establish Fort Orleans on its north bank near present Malta Bend, Mo. In the same year, the engineer La Renaudière briefly described the "Grand Village des Quans," consisting of 150 lodges standing near the Missouri on a small stream 30 leagues north of the mouth of Kansas River. From this village, presumably the one shown some distance above Kansas River on Montigny's map of circa 1728 (Nasatir, 1952, vol. 1, opp. p. 14), Bourgmond in the following year traveled to the Padouca to make peace between them and the Missouri River tribes.

The exact location of the Kansa village in Bourgmond's time has been established beyond reasonable doubt (Remsburg, 1911, 1919). The Montigny map, cited above, shows it on a small westerly tributary of the Missouri, some distance above Kansas River; and La Renaudière's statement that it was on a small stream 30 leagues above the "Quans" (Kansas) River is not far in excess of the 60 miles, by water, from Kansas River to Independence Creek near present Doniphan, Kans. When Lewis and Clark passed the second old Kansa village site, going upstream from Kansas River, in 1804, and named the stream just below it Independence Creek, they referred to Bourgmond's earlier visit to the Indian town which had stood on this spot. This is undoubtedly the earliest certainly identifiable Indian village in eastern Kansas.

From this Kansa village, Bourgmond left on October 8, 1724, on his second attempt of that summer to treat with the Padouca. He marched in a west-southwest direction, crossing grassy uplands and timbered streams during the first 3 days; and on October 11, a half day's march beyond 20 leagues of travel, he crossed the "Great River of the Canzes . . . at a ford. . . . It enters the Missoury about 20 leagues from where we crossed it . . . ." After the crossing, he continued west-southwest and southwest for approximately 48 leagues more, mentioning a number of streams and commenting on the abundance of bison, deer, stags (elk), turkey, etc. On the 18th, he met the Padouca, with whom he spent the next 3 days. On October 22, he set out on the return—not to the Kansa village, but to the Missouri some distance below. Distances and directions for each day of the return march are given, but almost no other details. For the first 2 days, he marched east-northeast for 15 leagues, there being nothing to indicate that he crossed any streams of consequence. Then he turned east for another 26 leagues, at which point he was across the "Canzes" River and camped on its north side. Continuing east for 24 leagues more, Bourgmond says on October 31 that "we are half a league from the Canzes River." At noon or in the early afternoon of November 1, for which day no distance is stated, he reached the Missouri, embarking next day by canoe for Fort Orleans.

Accepting the site of present Doniphan as Bourgmond's point of departure on this trip, his probable route to the Padouca and back to the Missouri can be determined with fair accuracy. There is, of course, some uncertainty in the fact that we can never be positive as to how much latitude must be allowed for such terms as "westsouthwest," "eastnortheast," etc., nor can we know the probable margin of error in the distances estimated in the day-to-day marches. Both directions and distances were unquestionably affected by irregularities of terrain and by other factors. Despite these and other difficulties, we may profitably attempt the reconstruction of his line of march. I have taken the value of the league on land, as used by Bourgmond, to be between 2.5 and 3 miles (cf. p. 28).

There seems little reason to doubt that Bourgmond crossed the Kansas River, outward bound, in what is now northern Shawnee County, between present Topeka and Rossville. His mention of a ford suggests, though it does not necessarily prove, that from the Kansa village he was making for a crossing point well known to the Kansa, Missouri, Padouca, and other Indians accompanying him—a point, perhaps, where better footing could be found than elsewhere along the stream. Such a crossing place, sometimes known as Rocky Ford and apparently frequently utilized during the 19th century, was situated about 18 miles above Topeka, near present Rossville and the juncture of Cross Creek with the Kansas River. This is approximately 60 miles, airline, from Doniphan; Bourgmond's distance to the ford, it will be recalled, is about 24 leagues, covered in 3½ days' march. I think it quite likely that this is where Bourgmond forded the Kansas River (see also Villiers, 1925, p. 111).

Continuing his march, Bourgmond evidently followed along the higher land back from the river and its short southerly tributaries, some of which he had to cross. The "hauteur de terres" mentioned on October 18 was probably the Flint Hills upland in northern Morris County, between the Neosho headwaters on the south and the short tributaries of the Kansas on the north. The final 2 days of marching (12 leagues, or 30–35 miles) seem to have been toward the west. This would put the final point reached—the Padouca camp or village—in or very near the Smoky Hill valley in the vicinity of Lindsborg or Salina. I see no real evidence that Bourgmond crossed the Smoky Hill, which flows north between Lindsborg and Salina, and thus would seem to have lain directly athwart his line of march. The allusion to a brackish stream on whose banks was a recently abandoned camp of the Padouca, and beyond which at 3 or 4 leagues he finally met the Padouca themselves, may be to one of the saline streams west and north of Salina; or it may refer to one of the creeks just east of Salina, such as Gypsum Creek, whose waters have a mineral content.

On the return march, Bourgmond traveled east-northeast for 2 days, or 15 leagues (ca. 40 miles). If the Padouca camp was in the Smoky Hill valley, as suggested above, such a march would have taken him to the vicinity of Junction City. Thence, marching overland in an easterly direction, he again crossed the Kansas River, probably at or near the ford utilized on the outward journey; and from here proceeded down the Kansas valley to the Missouri. Since he notes that on the last full day of this march he was half a league from the Kansas River, it seems possible that much of the return march was somewhat north of the stream, perhaps in the bluffs or uplands back from the river. The descent into the valley of the Kansas was then made only as they finally neared the union of the Kansas and Missouri Rivers.

This identification of Bourgmond's probable route to the Padouca, while not without its difficulties, seems to me a rather more satisfactory interpretation than most of those that have been attempted by earlier students. Hyde (1951, p. 42) locates the Padouca grand village "evidently in the district where the town of Salina now stands"; his map indicates it as on the Saline, somewhere in present Lincoln County and some 40 or 50 miles northwest of Salina. This I find difficult to reconcile with the repeated statements in the narratives that the Bourgmond party traveled mostly westsouthwest and southwest to reach the village; and it is even more difficult to see how 2 days march eastnortheast from this point, thence east, would lead to the Kansas River crossing. Likewise, it seems to me, Villiers' (1925, p. 112, and map 1, opp. p. 32) placement of the Padouca village in Rice County runs afoul of the directions and distances given for the return march to the Missouri. From Rice County, Bourgmond would have been crossing and recrossing the Smoky Hill and/or the Kansas several times, and of this I see no indication in the narrative. Connelley (1918, pp. 454–455) calculated that the Padouca were in Russell or Ellis County; but since this seemed to him surprisingly far east for a Padouca settlement, as indeed it does to me, he apparently rejected Bourgmond's distances and decided that the village was actually much farther west, in Trego or Gove County.

Whatever reliance one wishes to place in Bourgmond's estimates of his daily mileage, I do not see how the Padouca can have been much farther west than present Salina and still be reached by the Bourgmond party in the 10 days required for the trip each way between the Padouca and the Missouri River. The trips were close to 70 or 72 leagues each way; at 2.6 miles per league (cf. Villiers, 1925, p. 111), this would have meant 175 miles, or more, and an average day's march of about 17 or 18 miles. This daily mileage compares favorably with Pike's day by day marches from the Osage to the Pawnee in 1806, partly over the same terrain traversed by Bourgmond (Pike, 1810, pp. 132–143). I doubt that the Bourgmond party would have maintained an appreciably higher daily average over a 10-day period than Pike did.

Bourgmond's observations, as just reviewed, are of unusual importance for our purposes because they seem to have been rather carefully recorded and thus provide more data than do various other French documents dating from the first half of the 18th century. In the second decade of this century, the French became increasingly interested in the Missouri River area—an interest stimulated by the desire to locate valuable metals and to find a route to New Mexico via the Missouri and its tributaries. The only exploration of which there is much information is that of Claude Charles Du Tisné (Nasatir, 1952, vol. 1, p. 18), who on a second attempt to contact the Padouca, ascended the Missouri and Osage Rivers in 1719 to the Osage villages. Here he obtained horses and went overland toward the southwest, 40 leagues in 4 days, to two large villages of "Panichouachas," apparently somewhere in southeastern Kansas or in northeastern Oklahoma (p. 533). These people were said by Charles Legac, writing in New Orleans in 1721 and using Du Tisné information, to have 300 villages farther west whose inhabitants traded with the Spanish and warred with the "Paloguas" (Padouca). They refused Du Tisné permission to go on to the Padouca, who were their bitter enemies. Legac also mentions in his Memoir the Canses who descend the Missouri River, and the Panionassea to the north and northwest of the Red River.

Other memoirs in this period provide interesting scraps of information. Hubert, writing from New Orleans (Nasatir, 1952, vol. 1, p. 12), also mentions the villages of the "paniouassea," places them on the "R. des Acancas," and says they war with the "Padoquas" who trade with the Spanish. In the area farther north, he places the Kansas River 102 leagues up the Missouri and says that 120 leagues up the Kansas it forks, with one branch "running west," one northwest. From one of these forks it was only 25 leagues to the upper reaches of the River of the "Acancea," where there is a village of the Padoca. He repeats the fact of trade between the Padouca and Spanish whereby buffalo products were exchanged for knives and axes.

The manuscript map of Le Maire, dated 1716 and entitled "Carte Nouvelle de la Louisiane et pais circonvoisins," reflects little advance in knowledge of the Missouri beyond that depicted by Delisle in 1703. It shows the "R. des Cansez" below the Platte, and the Osages on the head of a river lower down. On the northern tributaries of the "Riv. des Akansas" are the Panis and Panioussa, a delineation distinctly reminiscent of the Delisle 1703 map cited above. In a memoir of 1718, Le Maire names the rivers of the Pani and Padouca (i. e., the Platte and Kansas) as the largest tributaries of the Missouri; and in a discussion of the Spanish trade, he observes that "The Spaniards who go to the Missouri fear to be robbed by the Apaches or Padoucas who are the Arabs of these parts . . ." (Villiers, 1925, pp. 65–66).

On the Missouri River itself, the French had apparently been long contemplating establishment of a stronger post than that which stood for a time at Fort Orleans, abandoned or destroyed in 1728 or soon after. Such a post was eventually established, though the date of its founding seems obscure. Nasatir (1952, vol. 1, p. 28) implies that "a new fort, Cavagnolle, was built near Kansas City" before the Mallet brothers made their trip from the Missouri across Nebraska and Kansas to Santa Fe, in 1739. At any rate, there seems to have been a fort somewhere on the Missouri above Kansas River during the 1740's and 1750's; and at times, if not continuously, there was apparently a Kansa Indian village in its neighborhood. If, as seems probable, Fort Cavagnolle is to be identified with the "remains of a fortification erected by the French" seen by Long (James, 1823, vol. 1, p. 110) on the west bank of the Missouri some 35 miles above Kansas River, it would appear that the fort stood just above present Fort Leavenworth and a few miles below Cow Island. At Fort Cavagnolle, Chapuis stopped in 1751 before his departure for the Pawnee, the Comanche, and finally Santa Fe. The post was still functioning in 1757, when Kerlerec wrote that "Fifty leagues further up [above the Missouri and Little Osages] are the Kansas, where Fort Cavagnolle is located, which consists of *un entourage de Pieux* which encloses some bad cabins and huts. The officer there commands seven to eight garrisoned soldiers and some traders. These Kansas were very numerous, but the wars that they have had with the Pawnees and small-pox have extremely weakened them. There remain today only 250 to 300 men. They are very attached to the French . . ." (Nasatir, 1952, vol. 1, p. 52).

French domination, politically at least, came to an end in 1763, when Louisiana was divided between the English and the Spanish. Though Frenchmen had evidently been beating up and down the Missouri River country for a long time and doubtless knew its native inhabitants well, much of the information they had acquired was slow getting into the written records. The maps dating from near the close of the French period show no decided improvement over such earlier ones as the Delisle map of 1718. The Dupratz map, dated 1757, again shows the

"R. of the Cansez," with a "Cansez" village some distance up the stream; but the "Cansez Gr. Village" is indicated on the west bank of the Missouri some distance above the Kansas River. West of the Osage, who are shown on a southerly tributary of the lower Kansas and on the Osage River, are the "Panis blanc," near the head of White [later Grand or Neosho] River. The "Country of the Padoucas" is shown west of the headwaters of the Kansas and on the upper Arkansas, west of what strongly suggests the great bend of the latter stream. The "Padoucas Gr. Village" is near the head of one of the westerly streams forming the Kansas, with additional villages on other streams in the region. The "Country of the Panis" is north of the Kansas River, along a badly misplaced east-flowing Missouri River. South of the Arkansas is the "Country of the Kanoatinos" [Wichita or ?]. Elsewhere, Du Pratz wrote that "The most numerous of all those nations [west of the Mississippi] are the Padoucas . . ." (Du Pratz, 1774, p. 321).

The data thus left us by the French from circa 1673 to 1763, as here reviewed, introduce us to a series of new tribal designations. The French approach to the region was generally from the east, that is, from the Mississippi Valley, with the documents indicating some infiltration along the westerly tributaries of the lower Mississippi, such as the Arkansas, by the second half of the 17th century, and more along the lower Missouri and its branches by the opening of the 18th century. By the mid-18th century, Fort Cavagnolle had been established near present Leavenworth, Kans. All of these operations brought the French into direct contact with the semisedentary or village Indian tribes of the eastern Plains.

For our purpose, the important point in this French activity is the indicated presence of a variety of native peoples following, as the Spaniards earlier noted, two ways of life. From the very beginning of French operations, there were a series of settled semihorticultural Indians in the eastern Plains; and these included in and around the area of our interest such groups as the Osage, Kansa, Pawnee, and probably the Wichita (Paniouassa, etc.). Farther west, up the Arkansas, Kansas-Smoky Hill, and other streams to north and south, were other peoples, hostile to the settled tribes and the French, and more directly involved with the Spanish in New Mexico. To the French, these were known by the general term Padouca or some variant thereof; and despite some confusion, the general implication seems to be that these were the people whom the Spanish knew as the Plains Apache.

In the Spanish period intervening between French and American control of Louisiana, the information available on the Kansas region continues to be fragmentary and vague. There are, however, two summaries of tribes in the area which are of interest. In 1777, Lieutenant Governor Cruzat included in a report to his superiors a tabulation of tribes receiving presents at St. Louis, and therein enumerated the following either certainly or probably in the region under consideration (Houck, 1909, vol. 1, pp. 142–145):

> Tribe of the Cances. This tribe is composed of 350 warriors . . . They are 150 leagues from this village [i. e., St. Louis], and are located on the banks of the Misury river itself, at a distance of some 50 leagues from the tribe of the Misuris . . . this tribe is hostile to the tribes of the said Misury river, named the Panis and La Republica . . . From the work of the hunt in which they are engaged, there results the profits of the trade which are made in the furs; for every year that trade produces 180 or 200 packs . . .
>
> Tribe of La Republica. This tribe is composed of 350 or 400 warriors . . . They are located some 220 leagues from this village, and about 110 from the Misury river on the shores of the Cances river, and about 40 or 50 leagues from the village of the tribe of that name by land . . . This tribe is hostile to the tribes of the Cances and the Big Osages . . .
>
> Tribe of the Panis . . . of 5 or 600 warriors . . . 230 leagues from this village, about 15 leagues from the Hotos [Oto] tribe, on a small stream branching off from the Plata river . . . hostile to the Canzes and the Sioux tribe . . .
>
> Tribe of the Big Osages . . . composed of 800 warriors . . . They are located 180 leagues from this village by water, and about 110 overland, on the banks of a river emptying into the Misury of about 140 leagues in length. This tribe is hostile to the tribes of La Republica, the Hotos, the Alkanzos, the Panis, the Piquies [Wichita], and the tribes living on the Misisipy in the English district . . . every year this tribe produces 500 or 550 packs of deerskins . . .

Eight years later, Governor General Miró at New Orleans compiled a description of Louisiana, dated December 12, 1785, which supplies additional details (Kinnaird, 1946, pt. 2, pp. 159–167). Here we are told that the "Rio de Cans, or Kansas . . . is 108 leagues from the mouth of the Missouri, on its right bank. At high water one may go up the river to the village of the Republica or Pawnees whom the Indians call *Paniguacci*, or 'eyes of the partridge.'" Other Pawnees, including the "Wolf Indians, or Panimahas" lived on the "Chato or Platte River," and on its tributary, "the Rio de Papas, or Wolf" that is, the Loup. Concerning the Indians themselves, Miró says: "The Kansas have their villages 140 leagues from the mouth of the Missouri on a very high bank two aranzadas from the shore of the river mentioned above [the Missouri or Kansas?] . . . have about 200 men who can bear arms . . . make war on the Pawnees in order to obtain horses. Their hunting lands are found extending up the Kansas River [sic] as far as the Nemaha River." The "Indians of the Republica, or Pawnees, called *Paniguaccy* or ojos de perdiz, live on the Kansas River 130 leagues from its mouth . . ." The Pados or Comanches, Miró wrote:

> were formerly the most numerous nation on the continent, but the wars which other nations have made upon them have destroyed them, so that today they

> form only four small groups. They wander from place to place constantly, and this saves them from the fury of the other nations who constantly make war upon them. They number about 350 men who are very skillful with the arrow and in running.
>
> The Laytanes, or wandering Apaches, who, like the Pados, are better known in those provinces than in this, live on the borders of New Mexico. They are considered the best warriors on the banks of the Missouri, and dominate all the neighboring nations. Although divided into various bands or parties, they live in perfect friendship. . . .
>
> Forty leagues from the mouth of the Missouri on the right bank, is the river of the Great Osages, quite a large stream, which flows from the west, one-quarter to the northwest. It is possible to go up this river to the village of the Great Osages situated 120 leagues from the Missouri; but high water is necessary for this. . . . The village of the Great Osages is situated 120 leagues in the interior on the river bearing their name. . . . The Great Osages are the most numerous tribe of the Missouri, at least of those with whom we trade. . . .

Finally, speaking of the village Indians of the lower Missouri, Miró observes:

> "It is necessary to state in passing, that the wealth of the Indians of the Missouri consists in having large droves of horses which they take from the Laytanes, or Apaches . . . ."

A few years later, the Frenchman Pedro Vial was dispatched from Sante Fe by the Governor of New Mexico, Don Fernando de la Concha, to "open direct communication with our settlements of Los Ylinneses, which are located on the shores of the Missouri River," that is, at Spanish St. Louis (Hulbert, 1933, pp. 48–54). Vial and two companions left Santa Fe in May, 1792, and traveled about 100 leagues in an easterly direction, much of the time along the Canadian River. Then they turned northeast "in search of the Napeste River, which we call in French the Arkansas River." Thirty-seven leagues from the Rio Colorado, or Canadian, the party reached the Arkansas. Following this stream, "which flowed east northeast . . . ," they presently came upon a hunting camp of Indians who "told me that they were Cances." This was evidently in the region of the great bend of the Arkansas in central Kansas. These Indians stripped the whites, robbed them of their horses, and otherwise ill-used them; but after some six weeks, in the middle of August, the Vial party "left with the above-mentioned Indians on their return to their village going in a northeasterly direction, and we have journeyed in ten days about 50 leagues going through level plains." On August 25, says Vial, "we reached their village, which is located on the River of the Kances. That river flows into the river called Misoury." Here they stayed until September, when they left with three French traders for St. Louis, finally reaching their destination on October 6, 1792.

Vial appears to have made a second trip over the same general route, for in 1795 Zenon Trudeau, Lieutenant Governor of "Western

Illinois," reported to Carondelet that "Pedro Vial, who two years ago was commissioned by the governor of Santa Fe to come to these establishments of Illinois, arrived this year (with four *mozos* who accompanied him) as far as the Panis nation (commonly called republic) which has its village on the bank of the Kansas [Republican?] River. . . . The mentioned Vial said he traveled from Santa Fe to the Panis in 8 days . . ." (Nasatir, 1952, vol. 1, p. 329).

In the final decade of the 18th century, prodded by reports of British activity on the Upper Missouri, the Spanish Government developed new interest in exploratory and trading expeditions to the Upper Missouri. In order to meet the British competition there, to open new areas for fur trading, and to find a route to the Pacific Ocean, several parties of traders departed from St. Louis, mainly on behalf of the newly organized Commercial Company for Discovery of the Nations of the Upper Missouri. Since their sights were focused on the upper reaches of the river, few seem to have taken much notice of the peoples inhabiting the lower valley. An exception is Jean Baptiste Trudeau, whose journal of his 1794–95 trip makes brief mention of tribes in what is now northeastern Kansas. Leaving St. Louis on June 7, 1794, Trudeau reached the Kansas River on July 12, an estimated 110 leagues from the mouth of the Missouri. He says (Nasatir, 1952, vol. 1, p. 261) that—

> this river in the spring is navigable for more than 100 leagues from its mouth. It abounds in beaver, otter, and other wild animals. 80 leagues from its mouth is the village of the Kansas; good hunters and good warriors.
>
> 10 leagues further up issues [illegible] which the Republican Pawnee inhabit. . . .

There are two items of especial interest in these documents from the latter part of the 18th century. One is the reported presence of the Republican band of Pawnee in the Kansas River drainage; the other is the shift of the Kansa Indians from their old habitat on the Missouri to a new one on the Kansas River. The time of this Kansa shift is nowhere clearly indicated, so far as I am aware; but the documents cited would seem to bracket the move within a period of a decade or so. Cruzat, for example, has them on the Missouri in 1777, and Miró's report of 1785 apparently confirms this. By 1792, according to Vial, they were certainly on the Kansas, where Trudeau locates them in 1794. On the other hand, the Bellin map of 1743 and the Delisle map of ca. 1750 (Paullin, 1932, pl. 23B, C) both show the Kansa on the Kansas River but not on the Missouri. Henry L. Ellsworth, in a letter to Indian Commissioner Herring accompanying the former's report of a treaty with the Oto and Missouri in September, 1833, mentions this shift, but without dating it, in the following words:

". . . the evidence is satisfactory that the Otoes attacked the Kansas at their old village on the Missouri near Independence creek—drove them from their village and took possession. The Kansas never afterward occupied that ground but pitched their tents 60 or 80 miles distant on the Kansas River . . ." (Nat. Arch., Off. Ind. Aff., Rec. Gr. 75, Treaty File).

With consummation of the Louisiana Purchase in 1803 and transfer of this vast, but vaguely defined, territory to the United States, the stage was finally set for systematic explorations. From these explorations, which were official functions of the United States Government, and from the additional observations of Government factors, military men, scientists, artists, and other travelers in the region, definitive information on the Indians and other features of the Missouri Valley was finally forthcoming. There are still a great many difficulties in the way of identifying precise tribal and village locations even from such meticulously kept and detailed journals as those of Lewis and Clark, Pike, Long, and their contemporaries and successors. On the whole, however, it is usually possible by this time to correlate locations and districts with modern knowledge of the area involved. For the most part, unfortunately, the tribes in our immediate area were now giving up many of their native culture traits, and they were destined to lose many more by the middle of the 19th century. It is, of course, in the sites of this period and somewhat earlier—roughly between 1775 and 1830—that the links between the fully historic tribes on one hand and the partially historic, or protohistoric, tribes on the other will have to be sought.

First and most ambitious of the American exploring projects to get under way in the new territory was the Lewis and Clark expedition. It reached the Kansas River on June 26, 1804, and remained until the morning of June 29. Here Clark noted that—

> This river receives its name from a Nation which dwells at this time on its banks & [has] 2 villages one about 20 leagues & the other 40 leagues up . . . they formerly lived on the South banks of the Missourie 24 Leagues above this river in a open & butiful plain, and were verry noumerous at the time the french first Settled the Illinois . . . [Thwaites, 1904–5, vol. 1, p. 60.]

Elsewhere (Thwaites, 1904–5, vol. 6, p. 84), in a summary of the Indian tribes met and reported, Lewis and Clark say of the Kansa, ". . . their village is 80 leagues [cf. Trudeau, in Nasatir, 1952, vol. 1, p. 261] up the Kanzas River . . ."; and again, in a table of geographic features of the Kansas River, they list "Bluewater river and the present village of the Kanzes just below . . ." Their "Bluewater river" is, of course, the Blue River of today, and the last item cited would place the Kansa village a short distance east of present Manhattan, Kans.

Continuing up the Missouri, Lewis and Clark camped on July 1st ". . . on the lower point of one of the two large & 2 small Isds Called *Isles des Parques* or field Isl'ds . . . one of the french hands Says 'that the french kept their cattle & horses on those Islands at the time they had in this quarter a fort & trading establishments.'" This was 29¼ miles above Kansas River, about opposite present Leavenworth. Next day, 11 miles farther up, they "camped after dark on the S. S. above the ["Bear Medesin," now Kickapoo] Island & opposit the 1st old village of the Kanzes, which was Situated in a valley, between two points of high land, and immediately on the river bank, back of the village and on a riseing ground at about one mile The French had a garrison for some time and made use of water out of a Spring running into Turkey [now Plum] Creek. . . ." Next day, July 3, they passed Cow Island; and July 4 they "came to and camped in the lower edge of a Plain where the 2nd old Kanzas village formerly Stood, above the mouth of a Creek 30 yds wide this Creek we call Creek Independence . . ." On the following day, they "proceeded on near the bank where the old village stood for two miles . . . The orrigan of this old village is uncertain M. de. Bourgmond, a French officer who Com$^d$ a fort near the Town of the Missouris in about the year 1724 and in July of the Same year he visited this village . . ." Both of these ancient villages are indicated on the expedition map, as is the inhabited Kansa village at the mouth of the Blue.

Two years later, Capt. Zebulon M. Pike traveled from the Osage villages on the river bearing their name to the upper valley of the Arkansas by way of the Republican River Pawnee (Pike, 1810). His party left the Osage towns in present Vernon County, Mo. (Chapman, 1946, p. 16), early in September, 1806, and entered Kansas in present Bourbon County. Thence, marching west by north, Pike crossed the Grand (Neosho) River and several headwater creeks of the Verdigris. September 11 to 12, he crossed the Flint Hills, camping successively on the South Fork of Cottonwood River and on the Cottonwood above present Cottonwood Falls. Approaching the latter point, the party "Passed very ruff flint hills. My feet blistered and sore. I stood on a hill, and in one view below me saw buffalo, elk, deer, cabrie [antelope], and panthers. Encamped on the main branch of Grand river, which had very steep banks and was deep. . . . The Indians [Osages accompanying Pike] alleged it was the Kans hunting ground, therefore they would destroy all the game they possibly could . . ." (Pike, 1810, p. 136). Despite the apparent abundance of game, no Indians were seen; but on September 15, while he was traversing the headwater creeks of the Cottonwood in present Marion County, Pike ". . . passed a very large

Kans encampment, evacuated, which had been occupied last summer . . ." (ibid., p. 137). Crossing the Smoky Hill above present Salina, the expedition turned northward across the Saline, Solomon, and lesser streams to reach on September 25 the village of the Republican Pawnee at what is today known as the Hill Site on the south bank of the Republican in Webster County, Nebr.[6]

Leaving on October 7 the village of the Pawnee, which had been visited a few weeks previously by a large force of Spanish under Malgares, Pike marched south by west to strike the Arkansas somewhere on the upper leg of its great bend. This stream he ascended to the mountains. Curiously enough, no Indians were encountered after he left the Pawnee town, although he was told that ". . . the Tetaus [Comanche] had recently killed six Pawnees . . ." Old campfires, probably left by Indian hunting parties who were not identified, were noted at several places along the route up the river.

Pike's "Chart of the Internal Part of Louisiana" (Pike, 1810), supplies additional information. The "Kanses Village" is shown on the north side of "Kanses River," immediately above (sic) the "Blue Earth River" [Blue River]. On the west bank of the Missouri, above Kansas River and below the "Nodowa R" [Nodaway], are two sites labeled "Old Vill Kans," both of which were reported by Lewis and Clark and appear again in later journals and maps of the region. The "Kanses crossing place" from the Smoky Hill crosses the Arkansas just below a "Strong Saline" [Rattlesnake Creek?]; and the "Kanses hunting Ground" lies south of this on the north side of the "Negracka River" [here evidently the Ninnescah River]. The "Crossing place of the L. Osage" is not far below the mouth of Pike's Negracka. The "Pawnee hunting Ground" is also south of what is evidently meant to be the great bend of the Arkansas, some distance west of the Kansa hunting grounds. The Osage villages, as already indicated, were outside present Kansas, on the Osage River in Vernon County, Mo.; but an Osage camp is shown on an unnamed tributary of the Arkansas, between that stream and the Vermillion [i. e., Verdigris]. For what is now western Kansas, no tribal locations are given; but Pike's general observations on the "internal parts of Louisiana" contain the following pertinent comment (Pike, 1810, app. to pt. 2, p. 17):

> The Tetaus or Camanche, as the Spaniards term them, Padoucas by the Pawnees, are a powerful nation, which are entirely erratic, without the least species of cultivation, and subsisting solely by the chase. But their wanderings are confined to the frontiers of New Mexico on the west; the nations on the Lower Red river on the S, the Pawnees and Osage on the E, and the Utahs, Kyaways, and various unknown nations on the N. This nation although entirely in our terri-

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[6] My reasons for believing that the Hill site, not the Kansas Monument site southwest of Republic City, Kans., is the scene of Pike's visit with the Pawnee have been set forth in Wedel, 1936, pp. 35–36.

> tories, is claimed exclusively by the Spaniards, and may be said to be decidedly in their interest . . .

Five years after Pike's trip, in the summer of 1811, Maj. George C. Sibley, factor at Fort Osage, made a 2-month excursion to the Indian country. According to Sibley, the Konsee (Kansa) town was situated—

> immediately on the north bank of the Konsee River, about 100 miles by its course above the junction with the Missouri; in a beautiful prairie of moderate extent, which is nearly encircled by the river; one of its Northern branches (commonly called the Republican fork, which falls in a few hundred paces above the village) and a small creek that flows into the north branch. On the north and southwest it is overhung by a chain of high prairie hills which give a very pleasing effect to the whole scene.

The village consisted of about 128 lodges, covered with skins, bark, and mats; patches of corn, beans, and pumpkins, were scattered in various directions about it; and the adjacent valley bottom was covered with horses and mules (Sibley, 1927, p. 198). The territory claimed by the tribe, he says, was "all that which is intersected by the waters of their beautiful river. It affords as yet abundance of game, and is supposed to be rich in fine furs."

From the Kansa town, Sibley marched "North 40° West about 120 miles to the Pawnee Towns." These were two in number, situated "on the north bank of the north branch (commonly called Otto fork) of the Platte, about 200 miles above its mouth." The Pawnee Republican town, which probably stood at what is today known as the Horse Creek site, 9 miles southwest of Fullerton, Nebr., on the Loup River (Wedel, 1936, p. 36), was inhabited "by three tribes of the Pawnees, two of which formerly dwelt on the north branch of the Konsee River, about 50 miles in a direct course, above the Konsee village. The successive incursions of the Konsees obliged them to abandon their old towns about two years ago . . ." This village consisted of about 170 earth lodges, but was expected to be about twice that size when the newly arrived people completed construction of their habitations. The Pawnee hunted and raided over a very extensive territory, said Sibley, and waged "an unceasing warfare against the Itans (or Hie-tans) from whom they plunder an incredible number of horses and mules, and many of these in turn fall into the hands of the Osages and Konsees, Ottos and Missouris, by theft and purchase. . . ."

From the Pawnee town, Sibley marched south by east an estimated 175 miles to a Little Osage hunting camp "on the bank of the Arkansas." En route, between the Kansas and Arkansas Rivers, he stopped briefly at a Kansa hunting camp, about 5 hours' journey from that of the Little Osage. Crossing the Arkansas with the Little Osage, Sibley then rode 30 miles southeast to the Great Osage hunting camp; and next day another 20 miles in the same direction to the hunting camp of the Arkansas Osages. Sibley noted that "the Osages (or as they call themselves Wa-shash-ees) are separated into three distinct tribes. The Cha-neers who live on the Arkansas, the Bar-har-che (or Great Osages), and the Eu-jet-ta (or Little Osages) who dwell on the Osage River . . ." Rejoining the Little Osage band, Sibley traveled with them to the Great Saline, on the Salt Fork of the Arkansas, and then to the Rock Saline, farther west on the Cimarron.

Sibley's estimates of distances traveled are unfortunately not very accurate. The Kansa village, if situated as he says at the mouth of the Republican, was much more than 100 miles by the river from its mouth. By water, the Republican is more than 170 miles from the Missouri, the Blue about 150. If "by its course" meant merely along the valley of the Kansas, not necessarily following the many turns of that stream, the Blue enters about 112 miles from the Missouri, and the Republican at 136 miles. The Blue River would thus be closer to his estimated distance from the mouth of the Kansas, and the terrain as he describes it would also seem to fit this location somewhat better. Still, Sibley was no newcomer to the Missouri River region, and he should have known what stream he was on when he reached the Kansa village. Regardless of the exact location of the Kansa, Sibley could not have reached the Pawnee towns on the Loup by 120 miles' march. Airline from the mouth of either the Blue or the Republican to Nance County, Nebr., where the Pawnee towns stood, the distance is nearly 150 miles; marching distance would be still greater.

Thus, Sibley's 1811 account indicates that the Kansa were on the north bank of the Kansas River, either at the mouth of the Blue or at the mouth of the Republican; the Republican Pawnee were in present Nebraska, having recently moved from the Republican River to the north bank of the Loup; the Kansa hunting camp was in east-central Kansas, just north of the Arkansas, perhaps on Cow Creek or the Little Arkansas; and the Little Osage hunting camp was probably on the east bank of the Arkansas in what is now southern Kansas. The Great Osage and Arkansas Osage may have been north of the Kansas-Oklahoma line, too; but the data are too vague to indicate certainly where their camps were situated.

The narratives of Maj. Stephen H. Long's exploring expedition to the Rocky Mountains in 1819–20 give us our next glimpse of the Indians of the Kansas region. Traveling up the Missouri River on the steamboat *Western Engineer*, Long arrived at Fort Osage (near present Sibley, Mo.) on August 1, 1819; and on the 6th, he dispatched an overland party of 13, in charge of Professor Say, to visit the

Kansa Indians while the steamboat carried the rest of the party upstream. Say reached the Kansa village of 120 earth lodges on August 20, and spent several days there; his eyewitness accounts are perhaps the best contemporary statement we have regarding this tribe. On the 24th, Say's party left the Kansa, traveling north "along the margin of Blue Earth creek [Blue River], a stream of the width of 25 yards, and greatest depth of three feet, which discharges into the [Kansas] river a mile or two above the Konza village . . ." (James, 1823, vol. 1, p. 131). Seven or eight miles from the village, they were set upon and robbed by a war party of Republican Pawnee, 140 in number, whose ". . . nation was at war with the Konzas . . ." (ibid., p. 135). Say returned to the Kansa village, resupplied himself, and then marched overland northeast to Isle au Vache, arriving there after departure of the *Western Engineer*, which his men finally overtook at the mouth of Wolf River. Two former village sites of the Kansa had been noted, meanwhile, by the river party as it proceeded upstream from Fort Osage. Some 24 miles, or slightly more, above the mouth of Kansas River, the narrative states (James, 1823, vol. 1, p. 110) that "The site of an old village of the Konzas, and the remains of a fortification erected by the French, were pointed out a few miles below Isle au Vache" [Cow Island is 7 miles above Leavenworth, in southeastern Atchison County, Kans.]. On the 25th, the boat left Isle au Vache and the party ". . . proceeded in the course of the day about 23 miles, and encamped at night near the entrance of a small stream called Independence Creek. A little above, and on the south [right] side of the river, is the site of an old Konza town, called formerly the village of the Twenty Four . . ." (James, 1823, vol. 1, p. 113).[7] Only the second of these two sites, designated "Old Konza Vill.," is shown on the map that accompanies the James edition of Long; it is just above "Independence R.," at present Doniphan, Kans. The inhabited "Konzas Vill." visited by Say is shown just below the mouth of "Blue earth R." on the north bank of Kansas River east of present Manhattan.

A year later, on his return from the Rocky Mountains in the summer of 1820, Major Long descended the Arkansas to a point a few miles above the mouth of the Purgatoire River. Here he divided his men; half the party, under Captain Bell, thence descended the Arkansas on its north bank, while the remainder under Major Long, marched south and east to Red River. Bell and his party of 11 men camped the night of July 25 about opposite, and slightly below, the mouth of the Purgatoire. In the afternoon of the 26th, probably west of present Big Sandy Creek and near or at the upper end of what was later termed the Big Timber, Bell came upon a large tipi camp—

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[7] Hyde, 1951, p. 48, suggests that this village was so designated because of Bourgmond's councils here in 1724.

> consisting of Kiawas, Kaskaias or Bad-hearts [Kiowa Apache], Shiennes (sometimes written Chayenne), and Arrapahoes. . . . These nations have been for the three past years, wandering on the head waters and tributaries of Red river, having returned to the Arkansa, only the day which preceded our first interview with them, on their way to the mountains, at the sources of the Platte river. They have no permanent town, but constantly rove, as necessity urges them, in pursuit of the herds of bisons, in the vicinity of the sources of the Platte, Arkansa, and Red rivers. . . . Their martial weapons are bows and arrows, lances, war clubs, tomahawks, scalping knives, and shields . . . [James, 1823, vol. 2, pp. 174–187].

Two days later, at noon on the 30th, Bell's detachment encountered an Arapaho war party, including one Kiowa, in present Hamilton County, Kans. On August 1, near present Lakin, Kearney County, they met " . . . a Shienne war party on their return from an expedition against the Pawnee Loups. They had killed one squaw . . . The party was armed with spears, bows and arrows, war-clubs, tomahawks, scalping knives, &c . . . " (James, 1823, vol. 2, p. 197). No meetings with Indians or their traces are reported during the next 10 days. On August 11, Bell's party camped opposite the mouth of Rattlesnake Creek, in southwestern Rice County; and shortly after noon of the next day, still above Cow Creek, they met " . . . an Ietan or Comanche (a band of Snake Indians) war party, 35 in number, of whom 5 were squaws. They had marched to attack the Osages . . .," but were surprised and soundly beaten by a small Oto war party. Bell noted further that "They were armed with the bow and arrow, lance and shield, and 13 guns, but by far the greatest number carried lances . . . " (James, 1823, vol. 2, pp. 207–211). Leaving this party after some difficulty, Bell continued down the Arkansas; and on the 15th, near its confluence with the Little Arkansas, he saw " . . . the appearance of an Indian village [that] proved to be a large hunting camp, which had probably been occupied during the preceding season . . . much bark covered the boweries, and a few pumpkins, watermelons, and some maize . . . " were observed (James, 1823, vol. 2, pp. 214–215). Next day they camped opposite " . . . the entrance of a large creek, of the width of 90 or 100 yards, and of considerable depth; it seems to be well wooded, and its course is nearly parallel to the river for a great distance, before it discharges into it. This stream is called the Red Fork; its waters are turbid, opake, and red . . ." On the map, this is called the "Negracka or Red Fork," and the journal leaves no room for doubt that Bell was camped opposite the mouth of the present Ninnescah River. This does not parallel the Arkansas, but the Cowskin just above does; and it is possible that from Bell's camp the timber along the Cowskin looked like a continuation of the valley of the Ninnescah. Two days later, on August 18, he crossed the "Stinking Fork," now Walnut River, near present Arkansas City, and camped 8 miles farther on the east side of a "small creek which we call Little Verdigris [now Grouse Creek]." Along this creek they also saw Indian lodges—bark-covered and some 60 or 70 in number—as well as cornfields, trails, etc. The lodges were unoccupied, but were presumed to belong to the Osage. On the following day, the 19th, the party crossed the present Kansas-Oklahoma State line and continued down the river.

Maps resulting from the Long expedition provide some further information. That which accompanies the James edition, in addition to the Kansa locations already alluded to, shows the Osage villages—Great and Little—on a large southerly tributary of Osage River. This, I presume, is either the Little Osage or the Marmaton, which would place the villages in present Vernon County, Mo., where Pike visited them in 1806. Clermo's Band of Osage is shown on the east side of what is evidently the Verdigris River, south of parallel 37° N. The High Plains about the heads of the Solomon, Saline, Smoky Hill, Arkansas, and southward are labeled "Great American Desert"; and between the "Solomon's Fork" and the "Republican Fork" is the legend: "The Great Desert is frequented by roving bands of Indians who have no fixed places of residence but roam from place to place in quest of game." The large original map prepared for Long but never published (U. S. 62, Cartographic Records Branch, National Archives) shows a second "Old Kanzes Vil[lage]" on the west bank of the Missouri below Cow Island, roughly midway between Kansas River and Independence River; but adds nothing regarding the Indians in central and western Kansas.

The report of the Reverend Jedidiah Morse to the Secretary of War on the condition of the Indians in 1820 includes short summaries of the tribes in our area. Quoting from a letter, dated Fort Osage, 1st October, 1820, from G. C. Sibley, factor, to Thomas L. McKenney, Morse states that the Kansa, numbering about 800 souls, resided in one village some 300 miles up the Kansas River, and that they hunted throughout its drainage and along the Missouri to the Nodoway. The Great Osages of the Osage River, estimated at 1,200 persons, lived in one village on the Osage River, 78 measured miles due south of Fort Osage, hunting in the Osage, Gasconade, and Neeozho [Neosho] River drainages. The Great Osages of the Neeozho, about 400 strong, had a village on the Neosho, "about 130 or 140 miles southwest of Fort Osage"; they hunted with the tribe of the Osage river, from whom "they separated six or eight years ago." The Little Osage were in three villages, totaled about 1,000 souls, and resided "on the Neeozho

River, from 120 to 140 miles southwest of this place." They hunted with the other Osage, and "frequently on the head waters of the Kansas, some of which interlock with those of the Neeozho" (Morse, 1822, pp. 203–204).

Elsewhere in the same report, Morse (1822, p. 237) gives the population of the Kansa at 1750, apparently on the authority of Maj. Benj. O'Fallon, Indian agent at Council Bluffs, and says that they "live on the northwest side of Kanzas river, at the mouth of the Grand Saline . . ."; their hunting grounds were on the upper branches of the river, from which the game was fast disappearing. The accompanying map shows the Kansa village on the north bank of the Kansas River, just above the "Earth River" whose upper course carries the name "Grand Saline." The Republican Fork is shown much farther west, and the "Earth River-Grand Saline" is without much doubt the Blue River. An "Old Kansas Vill" is shown on the right bank of the Missouri some distance above the Kansas River.

Farther west, according to Morse, were the Arrapahays (Arapaho), whose country extended "from the head waters of the Kanzas, south, to the Rio del Norte. They are a war-like people, and often making predatory and murderous excursions on their eastern and southern neighbors" (Morse, 1822, p. 253). Here, too, were the "Comauch Indians" (Comanche) who were "the largest and most war-like nation in this country. . . . During the winter, they occupy the country on the sources of the Brassos, and Colerado. They spend their summers on the sources of the Arkansaw and Missouri, among the eastern spurs of the Rocky Mountains. They carry on with traders from Red River, an extensive traffic in horses and mules, which they catch in the plains, or capture from the Spaniards" (ibid., p. 259). Other groups scattered over the western territory included the Castahana, Cataka, and Dotami, "supposed to be remnants of the Great Padouca nation, now under that name extinct, who occupied the country between the upper parts of the Platte and Kanzas river" (ibid., p. 366).

Insofar as recorded native tribal locations and movements might be expected to have archeological connotations, our chronological survey of Kansas ethnohistory here approaches the point of diminishing returns. There are several reasons for this. For one thing, the native peoples along the lower Missouri and its tributaries, including those in Kansas, had been in increasingly close contact with white traders for more than a century, and the disintegration of native technologies, crafts, and industries was unquestionably far advanced by 1825. Most of these Indians were making little or no pottery at this date; iron, brass, glass, crockery, steel traps, and machine-made textiles were rapidly superseding the older items of bone, stone, horn, shell, and other locally available materials. It is unlikely therefore that archeology could greatly amplify the data already available, or that yet to be extracted, from contemporary ethnographic and historic documents, published and unpublished; and I doubt that such confirmatory data as archeological investigations could perhaps add on this time level would greatly facilitate extension of tribal and cultural identifications back into earlier time levels. From here on, in short, the Indians of Kansas become the proper subject of the ethnographer, historian, and archivist, rather than of the archeologist.

Equally important is the fact that the year 1825 brings us to the threshold of the reservation period and, thus, to a series of wholly artificial tribal alinements. In the States east of the Mississippi, there was a growing public and official insistence on final expulsion of the Indian tribal remnants still residing there; consummation of the Louisiana Purchase, with acquisition of a vast and sparsely populated new territory provided an obvious solution to the problem of locating the Indians who were to be moved. As a prelude to transfer of these eastern Indians to the trans-Missouri region, it was necessary first to extinguish the primary land titles of the tribes residing there, thus restricting and defining their holdings and making available lands to be assigned to the newcomers. In line with this policy, the Government entered into a treaty with the Kansa and Osage in 1825 whereby the territory claimed by each was drastically reduced. By this transaction, the Osage became for a brief time a Kansas tribe, which they had been only in part previously. Into the lands given up by the Kansa and Osage came, within the next 15 or 20 years, a whole host of Indians formerly residing, mostly but not altogether, east of the Mississippi. Reservations were assigned to such diverse groups as the following: Oto, Missouri, Iowa, Sac, Fox, Kickapoo, Delaware, Shawnee, Chippewa, Ottawa, Peoria, Kaskaskia, Weas, Piankeshaw, Potawatomi, Miami, Wyandot, Cherokee, and New York Iroquois. Excepting those of the Kansa and Osage, the reservations assigned these tribes lay generally in the eastern third of the State, east of a line running north-south through the mouth of the Republican River. Some of the eastern reservation Indians, at least, were occasionally represented in hunting parties in central and western Kansas, where they came into conflict with the Pawnee, Cheyenne, Arapaho, Kiowa, and Comanche. For obvious reasons, none of these introduced groups is of interest directly or indirectly, in the prehistory of the Kansas region.

## HISTORIC INDIAN TRIBES IN KANSAS

The documentary record, as we have just reviewed it, suggests that the historic tribes who have been resident in what is now Kansas long enough and early enough to be of possible archeological significance number not more than five or six. This does not seem like a very impressive figure, considering the plethora of tribal and band names with which Spanish and French observers fill their narratives and cartographers besprinkle their maps during the 16th, 17th, and 18th centuries. Some of these names can be, and have been, reconciled with one another; oftentimes, but not always convincingly, they have been further identified with one or another of the recognizable designations for tribes well known in later historic times. Granting the possibility that minor tribal units may have been slighted or overlooked, it nevertheless appears that the actual number of tribes that can be said to have laid valid claim to territory in Kansas is not much, if any, in excess of the figure suggested. It also seems clear that these tribes, besides representing several distinct linguistic stocks, were distributed in rather close accord with the several natural regions that may be recognized in the State.

Western Kansas, geographically better suited to hunting than to horticulture, was successively occupied in historic times by Athapascan, Shoshonean, and Algonkian tribes. When the historical record opens in the 16th century, Plains Apache peoples appear to have been present here as elsewhere throughout the High Plains; and these groups were present until the first quarter of the 18th century. At that time the Shoshonean-speaking Comanche spread eastward from the Rocky Mountains, driving the Apache southward and taking over the High Plains. In the 19th century, the Cheyenne and Arapaho were the principal tribes between the Arkansas and Platte Rivers, with the Comanche, Kiowa, and Kiowa Apache mainly south of the Arkansas. Farther east, along the border of the High Plains, the first Spanish explorers found the people of Quivira, a semisedentary group who were almost certainly the Wichita or a closely related Caddoan group. As the Paniassa, they seem to have been in southern Kansas or northern Oklahoma into the 18th century. Still farther east, certainly by the last quarter of the 18th century, were the Kansa, and southeast of them, near the Missouri-Kansas line were the Osage, closely related tribes of Dhegiha Siouan affiliations. Both remained in or near this region throughout the 19th century, moving steadily southward and westward to their final residence on reservations in Oklahoma. Late in the 18th century, there was at least one Pawnee village in northern Kansas, on the Republican River, and much of northern Kansas remained the hunting ground of the Pawnee.

## SIOUAN TRIBES IN KANSAS

The two Siouan tribes, Kansa and Osage, who merit consideration in connection with Kansas Indian history and prehistory were both of the Dhegiha branch. Their earlier history, prior to the first French notices concerning them, is vague and uncertain. According to often-cited migration legends collected by Dorsey (1886, pp. 215–218), the Dhegiha Siouans long ago dwelt east of the Mississippi River, whence they pushed westward. As one nation, they were known to the Illinois as the Arkansa or Alkansa, and lived near the Ohio. At the mouth of this stream, the Quapaw split off and moved southward; the other tribes, including the Omaha, Ponca, Osage, and Kansa ascended the Mississippi, stopped for a time at the mouth of the Missouri, and then moved up that stream. At the mouth of the Osage, the Omaha and Ponca crossed the Missouri; the Osage ascended the stream which acquired their name, dividing into the Great and Little Osage at an unnamed tributary and finally settling down. The Kansa continued up the Missouri on its south side until they reached Kansas River, where they tarried for a time. Resuming their wanderings, they ascended the east side of the Missouri to the present northern boundary of the State of Kansas, where the hostile Cheyenne compelled them to retrace their course. They then established themselves at the mouth of the Kansas, where the "Big Knives" came with gifts and induced them to go farther west.

Beyond the vague and non-committal "ages ago," there is nothing in this legend to indicate how much time may have been involved in the migrations set forth. Neither is there at present any archeological confirmation that the Ohio Valley was the homeland of the Siouans, as the traditions claim. The available linguistic and ethnologic evidence shows, however, that the Kansa and Osage tribes were closely related, and their separation need not have taken place very long before their appearance in history. The habitat of the Osage since the beginning of records concerning them was in the area to which the traditions bring them and where they resided until approximately 1820. As for the Kansa, there is at the moment no independent confirmation of an early stay at the Missouri-Kansas River junction; but what the legends have to say regarding their residence on the Missouri above the Kansas, but not farther north than the Kansas-Nebraska boundary, prior to their settlement on the Kansas River, is in line with their documentary history since at least 1723. That they ever dwelt on the east side of the Missouri has not yet been demonstrated on historical or archeological grounds. It may be significant, however, that Chouteau in 1816 described their earlier hunting grounds as lying both east and west of that stream, whereas in historic times they seem to have hunted mostly west of the Missouri (Chouteau, 1816, and map in Tucker, 1942, pl. 41). This, plus the fact that there are reported to be sites of late prehistoric or protohistoric age and of Oneota affinities on the east bank of the Missouri below Nodoway River, may hint at former residence of the Kansa, or of one of their near relatives, in that locality.

### THE KANSA

On documentary grounds, the Kansa seem to have been resident in the State about as long as any of the historic groups; and they can justifiably be termed primarily a Kansas tribe. I have elsewhere published a sketch of the Kansa (Wedel, 1946), and here we need only review briefly their recorded movements (fig. 4). The earliest reference to them, so far as I have been able to determine, is by the French in the second half of the 18th century—specifically, on maps resulting

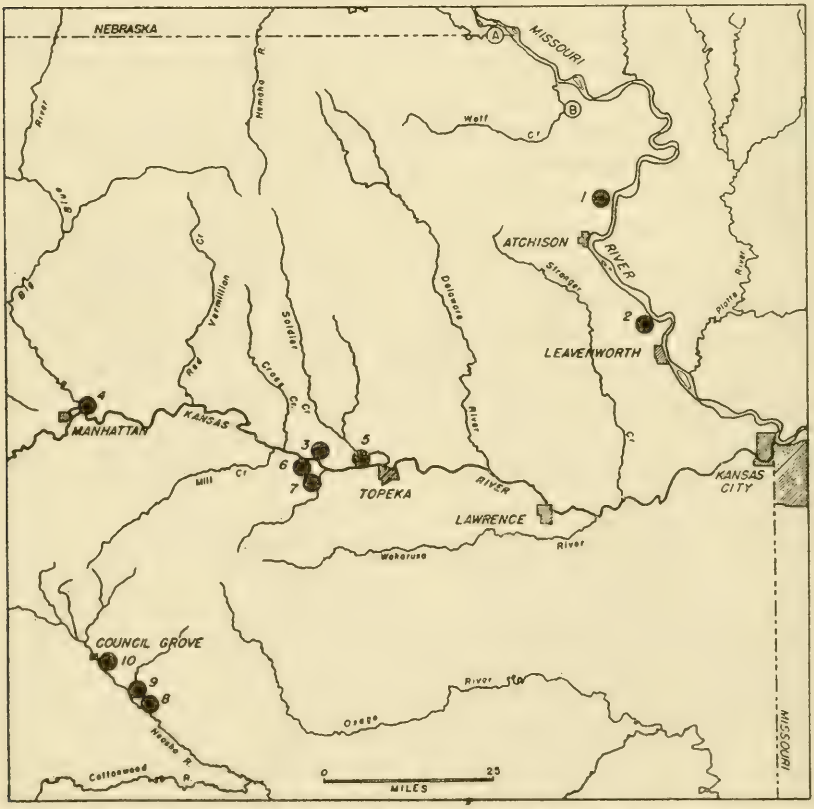
NEBRASKA
MISSOURI
A
B
Wolf Cr
Nemaha R.
River
Blue
Big
Cr
Vermillion
Red
Soldier
Cross Cr.
Cr
Delaware
River
1
ATCHISON
RIVER
Stranger
Cr
Platte River
2
LEAVENWORTH
4
MANHATTAN
KANSAS
3
5
6
7
Mill Cr
TOPEKA
RIVER
LAWRENCE
KANSAS CITY
Wakarusa
River
COUNCIL GROVE
10
9
8
Neosho R.
Cottonwood R.
River
Osage
0
25
MILES
MISSOURI

FIGURE 4.—Principal known Kansa village sites in Kansas during the 18th and 19th centuries. Numbered sites include: *1*, Doniphan site, the "grand village des quans" visited by Bourgmond, 1724; *2*, Salt Creek site, near old Fort Cavagnolle, 1757; *3*, the "old Kanzas village" reported by Lewis and Clark, 1804, exact location unknown; *4*, Blue River site, 14PO24, near Manhattan, occupied ca. 1800–1830; *5*, Fool Chief's village, 1830–46; *6*, Hard Chief's village, 1830–46; *7*, American Chief's village, 1830–46; *8*, Hard Chief's village, 1847–73; *9*, Fool Chief's village, 1847–73; *10*, Big John village, 1847–73. Lettered sites include *A*, Leary site, and *B*, Fanning site, both Oneota and antedating the Kansa sites shown by number.

from the Marquette and Jolliet expedition of 1673. If the Spanish had prior knowledge of the tribe, I have found no convincing evidence of the fact. Earlier allusions by the Spanish to what was supposed to be the Kansa seem to me to be either inconclusive or highly improbable. The Guas, for example, to whom Castañeda says Father Juan de Padilla was trying to extend his missionary efforts from Quivira when he was martyred in 1542 or soon after (Hammond and Rey, 1940, p. 263), have been identified with the Kansa (Hodge, 1907–10, pt. 2, p. 1058); but in the absence of any details, beyond the name and the assertion that the Guas were enemies of the people of Quivira, I fail to see how a convincing correlation is possible here. Again, the Escansaques met by Oñate in 1601, apparently somewhere in present southern Kansas, have been cited as "the earliest recorded notice of the Kansa" (Hodge, 1907–10, pt. 1, p. 653); but the brief description Oñate gives of this nomadic, bison-hunting, tent-dwelling people sounds much more like one of the Plains Apache groups whom the contemporary Spanish were calling "Apaches Vaqueros." I have grave doubts, too, that the still later Spanish references to the Canceres, allies of the French, as given in Martinez' declaration of November 23, 1720, "clearly indicate," as Thomas says (1935, pp. 171, 277), the location of the Kansa in the early 18th century. Such a location would put the Kansa in southeastern Colorado or southwestern Kansas at just about the time Bourgmond and La Renaudière clearly say that the Kansa town was on the Missouri River in the northeastern part of Kansas, and more than 400 miles from the Sierra Blanca. It seems much more probable that the Canceres were also Plains Apache (Hodge, 1907–10, pt. 2, p. 1036).

The earliest documented Kansa village evidently stood at the junction of Independence Creek and the Missouri, on the present site of Doniphan, Kansas (Remsburg, 1919), about 60 miles by water above the Kansas River. Here the Kansa are shown on the Delisle map of 1718 (Tucker, 1942, pl. 15), were reported by La Renaudière in 1723 (Margry, 1886, pt. 6, p. 393), and were visited the next year by Bourgmond (ibid., pp. 398–449). Whether they were already at this location half a century earlier, in Marquette's time, when they first emerge into recorded history, we have no way of knowing, nor have I found any record as to when the spot was abandoned. In the 1740's and 1750's, the Kansa were farther downstream near the mouth of Salt Creek, a few miles north of present Leavenworth, and about 35 miles above Kansas River (Remsburg, 1919); and here for a time stood a French post, Fort Cavagnolle. Whether this village was continuously inhabited and over what period is again obscure, but the records hint at occasional absence of the Indians from the vicinity of the post (Nasatir, 1952, vol. 1, p. 48). From here, sometime after 1757 or 1777, the Kansa moved west and south to the Kansas River; so far as I can determine, they did not again reside in a permanent village on the Missouri. Their oldest identified village site on Kansas River is that at the mouth of the Blue River, about 2 miles east of the present Manhattan. In this locality the Collot map of 1796 (Collot, 1924) and the DuLac map of 1802 (DuLac, 1807) place the tribe; Trudeau, writing in 1794, has the Kansa 80 leagues up the Kansas, which would place them far above the Blue (Nasatir, 1952, v. 1, p. 261). If sites earlier than this at the mouth of the Blue actually exist on Kansas River, they have apparently not been located or identified. According to Lewis and Clark (Thwaites, 1904–5, vol. 1, p. 60), the Kansa had two villages in 1804," . . . one about 20 leagues and the other 40 leagues. . ." up the Kansas. Elsewhere, however, in a summary table of various features of the Kansas River system (Thwaites, 1904–05, vol. 6, p. 36), they note "The old Kanzas Village" on the north bank 9 miles above "Heart River" (Soldier Creek) and 40 miles from the Missouri; and "Bluewater river and the present village of the Kanzas just below" are said to be 80 miles up the Kansas. The latter reference is clearly to the Blue River location; the old village is supposed to have stood somewhere in the vicinity of present Silver Lake, between Soldier Creek and the Red Vermillion. Strangely enough, the Lewis and Clark map does not show the old village below the occupied one; but it does indicate an "Old Konza Vill" on a narrow neck of land between the Republican and Kansas Rivers immediately above their junction. This would appear to be on the spot now occupied by Junction City. So far as I am aware, these two old villages have never been located.

The Blue River village is supposed to have been the principal settlement of the Kansa for some 30 years or more, but it may not have been the only one. According to McGee (1897, p. 193), a Kansa village of 1500 people occupying 30 lodges stood at the mouth of Saline River, where "After the cession of Louisiana to the United States, a treaty was made between the Indians and the government"; but I can find no independent confirmation of this location. Again, Sibley in 1811 (Sibley, 1922) locates the Kansa in 128 lodges just below the mouth of the Republican "about 100 miles by its course above the junction with the Missouri." The Republican joins the Kansas 135 miles by land above its mouth; and Sibley's description of the village surroundings would fit the Blue River site as well as, if not better than, the junction of the Republican and Kansas. A few years later, Morse (1822, p. 237) has the Kansa at the mouth of the "Grand Saline River," though his map shows them immediately above the "Earth River" whose upper course is labeled Grand Saline. Here there is manifest confusion about the tributaries of the Kansas River (see also Melish, 1818, and Bradbury, 1817), but the location given on the Morse map can hardly have been anything else than that at the mouth of the Blue River. I know of no contemporary map for the period from 1800 to 1830 which locates the Kansa above the mouth of the Blue, variously known as Blue Earth, Blue Water, etc.

Following their treaty with the United States in 1825, the Kansa began a drift eastward, and the Blue River location seems to have been finally abandoned by about 1830. In 1834 Townsend (1839, pp. 32–34) found them mostly in two villages on both sides of Kansas River a few miles west of present Topeka, with a third and smaller village of 30 lodges some distance upstream on the north bank, but below the Vermillion River. Four years later, in 1838, Richard Cummins, Indian agent, reported the Kansa still in three villages—the two lower ones apparently in the vicinity of present Rossville, and the third some 30 miles upriver (Comm. Ind. Aff., for 1838, p. 478). Whether these were the same locations as those given by Townsend, I do not know. According to Morehouse (1908, p. 346) and Adams (1904), the principal Kansa towns from 1830 to 1846 were a few miles above present Topeka (see also Chouteau in Anon., 1881, p. 387 fn.). The largest, under Fool Chief, stood on the north bank of Kansas River, about 6 miles above Soldier Creek and just north of Menoken (Cole, 1904, p. 483). Two miles south of the river, on the west side of Mission Creek, was American Chief's village of 20 lodges; 2 miles away, on high land nearer the river and about 1½ miles west of Mission Creek, was Hard Chief's village of 100 lodges. Below Fool Chief's village, where Father De Smet visited in 1841, were the halfbreed allotments; and below them, near present Williamstown, was the first tribal agency, with blacksmith shop and farmer attached. In this locality was opened, under Methodist auspices, the first mission among the Kansa.[8]

From this locality, following the treaty of January 14, 1846, the Kansa moved southwest a few miles to their new reservation on the Neosho River. Here, in the vicinity of Council Grove, they dwelt in three villages from 1847 to 1873. Hard Chief's village, largest of the three, was on Cahola Creek south of present Dunlap. Fool Chief's village stood in the Neosho valley near the same place. The third village was to the northwest, near Big John Creek southeast of Council Grove and near the agency. From these villages of bark-, mat-, and skin-covered lodges, according to Morehouse, the Kansa continued their seasonal bison hunts into the Plains to the west. Eventually, this resulted in a well-defined trail, which began near the mouth of Big John Creek southeast of Council Grove. Thence this trace, known as the Kaw Trail, ran slightly south of west to cross

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[8] Swanton, 1952, p. 293, lists the names of more than 20 Kansa villages, including two on the Big Blue, one at its mouth, and 12 or more at various points along Kansas River.

Diamond Creek within a few yards of the Diamond Springs railway station. Entering Marion County near the old Bethel post office on the head of Middle Creek, not far from present Lincolnville, it continued westward through Marion and McPherson Counties to the forks of Cow Creek, a few miles south of present Lyons. The route generally paralleled that of the Santa Fe Trail, at a distance of 3 to 6 miles to the south. From the hunting camp here in central Rice County, some of the Indians returned with their kill to the villages on the Neosho; others, preferring the buffalograss as forage for their horses, spent the winter on the spot.

Greatly reduced in numbers by disease and neglect, and under continual pressure from white settlers, the Kansa finally gave up their lands on the Neosho. In 1873, just 200 years after their first recorded notice, the remnants of the Kansa finally left the Neosho and settled on a portion of the Osage Reservation in northern Oklahoma. Today what remains of this tribe resides in a small tract near the Arkansas River in Kay County, Okla.

## THE OSAGE

The Osage emerge into written history at the same time as the Kansa, that is, with the Marquette and Jolliet explorations of 1673. As with the Kansa, it is impossible to locate them precisely at this time, but they were apparently west of the Missouri Indians and south of the Missouri River. For more than a hundred years the location of their villages is given by various observers and commentators in such general terms that it is not possible to indicate them accurately on modern maps. We do not know, of course, how permanent the villages were, but it seems likely that throughout much or most of this time they were on the Osage River, well above its mouth, and probably within relatively few miles of the eastern Kansas line.[9] It is not improbable, therefore, that they left some as yet undiscovered or unrecognized evidence of their presence, either as hunters or as temporary residents, at the extreme edge of the area with which this paper is primarily concerned; and it is a historical fact that they were resident in Kansas for at least 50 years prior to their final removal to the Indian Territory. Moreover, their residence just outside the State but in proximity to other tribes who were living in eastern and southern Kansas and their long-continued warfare against these tribes, makes them a factor that must be considered.

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[9] There is, of course, wide variation in the estimates given by early writers for the distance from various points (e. g., St. Louis or the mouth of the Missouri River) to other points up the Missouri; and, in the present problem, for the distances from the mouth of the Osage River to the Osage villages. The following actual figures on the 1890 thalweg, or channel line, distances from the mouth of the Missouri may be helpful: to the mouth of Osage River, 137.6 miles; mouth of Grand River, 260.7 miles; mouth of Kansas River, 392 miles; mouth of Big Nemaha, 534.5 miles; mouth of Platte River, 636.9 miles (letter of 1 December 1953 from L. G. Feil, Chief, Engineering Division, Kansas City District, Corps of Engineers, U. S. Army, to Wedel).

As measured by map gage on the U. S. Geological Survey quadrangle sheets, the distance from the mouth of Osage River upstream to the Little Osage, near which the Osage were living in 1806, is very nearly 280 miles. At 2.6 miles per league, therefore, the Osage River enters the Missouri 53 leagues above the mouth of the latter; and the Osage villages in present Vernon County, Mo., were approximately 100 leagues up the Osage River.

Although the Marquette and Jolliet maps do not include the Osage River, it is possible that already at this time the tribe was living on that stream. In 1687, according to Hennepin, the Osage occupied 17 villages on a river bearing their name, which discharged into the Missouri. Tonti in 1692 observed only that they were near the Missouris and Otos in some prairies 150 leagues up the Missouri River. In 1700 Tonti wrote that on the banks of the River of the Ozages there were 300 lodges of Osage, located 15 day's journey by canoe from the mouth of the Missouri; from the Osage to the Kansa was a 3-day journey. In 1717 Bourgmond mentions "the Osage River because of the tribe which lives there and bears the same name." Soon after, in 1719, Du Tisné made the first recorded visit by a Frenchman to the tribe; he locates one village 80 leagues above the mouth of Osage River, with another 30 leagues distant from the Grand [Osage] village and 1½ leagues southwest of the Missouri village, the latter evidently on the Missouri River in present Saline County, Mo. In the same year, La Harpe locates the Missouri town 80 leagues up the Missouri, with an Osage village a league distant and the Grand [Osage] village 30 leagues away. In 1769 Rui reported that the River of the Big Osages "goes to the tribe called by the same name, which is some 70 leagues from the mouth." Du Pratz in 1757 wrote that the Osage were situated upon a small river of the same name; and Cruzat 20 years later reported them on a tributary of the Missouri, distant from St. Louis 180 leagues by water and 110 overland (Houck, 1909, vol. 1, pp. 142–145).

According to Miró, writing in 1785, the village of the Grand Osage was then 120 leagues up the river of that name, i. e., the Osage; and the Little Osage, of whom a part had removed to the upper waters of the Arkansas River, are somewhat ambiguously placed about 80 leagues from the junction (of the Osage?) with the Missouri, about 1 league from the Missouri village. The implication here would seem to be that the Little Osage, or a part of them, were still, or again, on the Missouri River near the remnants of the Missouri, but that a portion of them had moved southward onto the Arkansas or one of its tributaries. This situation is also reflected in Trudeau's journal of 1794, which implies that the Little Osage had recently fled to the Osage River for safety (Nasatir, 1952, vol. 1, p. 261).

Lewis and Clark (Thwaites, 1904–5, vol. 6, pp. 83–84) have the Osage villages 80 leagues up the Osage River, on which stream they say the larger part of the Great Osage tribe had resided since they first became known to the inhabitants of Louisiana. Some 3 years prior to their visit, about half the tribe had moved to the Arkansas drainage; and the Little Osage, who had lived for a time on the southwest side of the Missouri River near Grand River, had been compelled to seek refuge with the Great Osage. The Osage claimed lands within a boundary running along the Niangua River, thence southward to the Arkansas 100 miles below the three forks (Arkansas-Neosho-Verdigris?), up the Arkansas and a southerly fork (Cimarron River?) to a point some distance above the Great Saline (Great Salt Plain, Alfalfa County, Okla.), and nearly to Kansas River, thus including a large area in the southeast part of the present State of Kansas. The Nicholas King map of 1806, based on the Lewis and Clark observations (Tucker, 1942, pl. 31B), has the Little Osage in the fork between Swan Pond River (Marais des Cygnes, or Osage) and Long River (Little Osage River); and the Osage village, of 1,200 warriors, is shown some distance downstream below Cookesfield River (now Sac River?) and The Fork (Pomme de Terre River?), which would seem to locate them in present St. Clair County below Osceola.

In 1806 Pike visited the Osage, and his map shows the Great and Little bands on the upper waters of Osage River, apparently near the junction of the Osage and Little Osage Rivers. According to his journal (Pike, 1810, pp. 116–126), this locality was approximately 360 miles by water up the Osage River; the true water distance is about 280 miles. The third band or village of Osage was to the southwest, in the Arkansas drainage. Sibley's observations 5 years later suggest that the Osage were then distributed in about the same fashion (Sibley, 1922).

By 1820 the drift from the upper Osage River and out of the State of Missouri was well under way. The Osage were then scattered in three separate localities. According to James (1823, vol. 2, pp. 244, 251), on the authority of Sibley, the Great Osage were still near the headwaters of Osage River; Sibley (Morse, 1822, p. 203) puts them 78 measured miles due south of Fort Osage, which would be in present Vernon County, Mo. The Little Osage, along with some of the Great Osage, were on the Neosho River, evidently in what is now Neosho and Labette Counties, Kansas. The Osage of the Oaks (Chaneers or Arkansas Osage) were on the lower Verdigris River, apparently some 55 miles from its mouth, in present Oklahoma. According to Sibley (James, 1823, vol. 2, p. 248), this latter band had been induced to move to the Arkansas by Chouteau, prior to the cession of Louisiana territory to the United States, when Chouteau found himself barred from the Osage trade by the monopoly granted Manuel Lisa by the Spanish authorities.

The exact locations of the Osage villages on the river bearing their name, as reported by French, Spanish, and other observers and writers during the 17th and 18th centuries, have not been conclusively established; and the generally vague and incomplete statements in the contemporary documents make this matter of present day identification a formidable problem indeed. At the same time, Chapman and his colleagues (Berry, Chapman, and Mack, 1944; Chapman, 1946, 1952) have made a good case for identification of certain sites in Vernon and Saline Counties, Mo., with late 18th- and early 19th-century Osage villages. Earlier Osage sites, if not in the same localities, apparently still await discovery or identification.

In 1825 the Osage ceded the lands they claimed in and west of Missouri, in Arkansas and Indian territories, and south of Kansas River. They reserved a strip 50 miles wide and some 75 miles long, beginning 25 miles west of the Missouri line and running west along the southern boundary of Kansas (Royce, 1899, p. 708). Apparently, they had already moved entirely out of Missouri by 1822 (Berry, Chapman, and Mack, 1944, p. 3), congregating on the Neosho River in southeastern Kansas. The exact location of the new villages seems uncertain; but they are thought to have been scattered along the Neosho from present Oswego, Labette County, upstream to approximately Erie, Neosho County (McDermott, 1940, p. 127, n. 28; Abel, 1904, p. 77 fn.). In this locality, on the east bank of the Neosho at present St. Paul, a Catholic mission and school were established in or about 1846. Also in this general locality, Tixier visited the Osage in 1840 (McDermott, 1940), found them living in bark- and mat-covered lodges, and accompanied them on their summer buffalo hunt to the treeless plains west of the Arkansas and on to the Great Saline on the Salt Fork of the Arkansas. On this hunt, the Osage traveled from the Neosho to the Verdigris; from this stream the route is not detailed but very likely was close to the Osage trail described by Mead for a somewhat later period. This is said to have left the Verdigris near the mouth of Fall River in southern Wilson County, running northwest to the Walnut near present Eldorado, and on to cross the Arkansas a few miles above present Wichita.

After some 40 years' residence on the Neosho, the Osage in 1865 relinquished to the United States a 30-mile block at the east end of their reservation, where the school, mission, and agency establishments stood, and moved 40 or 50 miles west to the Verdigris drainage. Here six or seven new villages sprang up; they consisted of skin- or mat-covered lodges, surrounded by extensive cornfields tilled with hoes by the women and children. Their stay here was a short one, however. White settlers, taking advantage of the absence of the Osage on their periodic buffalo hunts, steadily encroached on the lands set aside for the Indians and stubbornly resisted eviction. The bison, moreover, were disappearing from the Western Plains before the increasing inroads of professional hunters and Indians equipped with firearms, so that the traditional tribal hunts were less and less successful. Yielding to the growing pressure from all sides, the Osage finally gave up their lands in Kansas, and in 1872 moved a few miles south to a new reservation in the Indian Territory. Here, in what is now Kay County, Okla., their descendants reside today.

## CADDOAN TRIBES IN KANSAS

The problem of Caddoan peoples in Kansas is a difficult and complex one. Unlike the Kansa and Osage just considered, whose names are usually readily recognizable from their earliest mention in the historical literature, the Caddoans involved appear under a puzzling variety of names. Moreover, it seems possible that some of the vague and still unexplained terms used by the early French and Spanish may also refer, at least in part, to Caddoan peoples. The historic distribution of Caddoan tribes from Texas to North Dakota suggests the possibility that some of the northern representatives of the stock, such as the ancestral Pawnee, may have passed through what is now Kansas at some remote time. Thus, the reconstruction of their history involves not only the locating and identification of their various historic or documented habitats, but also the eventual isolation and recognition through archeological means of the older sites marking their passage from south to north along the eastern margin of the Great Plains, including eastern Kansas.

### THE PAWNEE

So far as there is documentation in terms of certainly identifiable historic tribal groups, the Pawnee and Wichita are the only tribes of Caddoan stock whose former residence in Kansas can be actually demonstrated. Of these, the Pawnee were primarily a Nebraska tribe and only secondarily a Kansas tribe. Their main villages throughout the historic period, to judge from historical accounts, maps, and archeological evidence, were mostly in east-central Nebraska—usually on the lower Loup River, on the Platte above and below its juncture with the Loup, and less frequently on the Blue River in southern Nebraska and on the Republican (Strong, 1935, pp. 15–16; Wedel, 1936, 1938; Hyde, 1951, p. 130). Throughout much of the historic period, the hunting grounds of the Grand, Republican, and Tappage Pawnee lay mainly south of Platte River, including much of north-central Kansas north and west of the great bend of the Arkansas; and, according to Pike and others, they also hunted south of that stream. Of the former Tappage Pawnee village sites said by Dunbar

(1880, p. 260) to have been pointed out on the Smoky Hill in western Kansas, which may or may not be the same as the Tappage Pawnee sites said by Connelley (1918, p. 442) to have been inhabited on the Smoky Hill possibly as late as 1830, no evidence has yet come to light.

Actually, only two Pawnee village sites have been identified to date in the Kansas River drainage, and these are both on the Republican. One, known as the Hill site, stands on the right bank of the Republican in Webster County, Nebr., about 7 miles below Red Cloud; the other, designated in the archeological literature as the Kansas Monument site, is some 30 miles downstream, also on the right bank, west and south of the town of Republic, Kans. The upper of these two is very likely the site of the Republican Pawnee village visited in 1806 by Pike; and it seems very probable that the lower is likewise assignable to that group, possibly at a slightly earlier period.

The Republican Pawnee, as a separately recognized tribal or village unit, apparently make their first appearance in recorded history in 1775 when Piernas, lieutenant governor of Spanish Illinois, listed the "Republic" among the nations "with which we are accustomed to trade in the dependency of the Missouri River . . ." (Kinnaird, 1949, pt. 1, p. 228). Two years later, in 1777, Cruzat (Houck, 1909, vol. 1, pp. 142–145) included them in his list of tribes receiving presents at St. Louis. They are again mentioned in Miró's report of 1785 to Rengel (Nasatir, 1952, vol. 1, p. 126), where they are termed the "Panis Republic, called Paniguacey or Eyes of the Partridge [Ojos de Perdiz]," and were said to "live on the River Cances about 130 leagues from its mouth." Taken literally, this would place them on the Smoky Hill far out in central Kansas, perhaps in Ellsworth or Russell County, away from the stream which bears their name and in a locality where no historic documents or maps indicate a Pawnee village at this period. It seems much more likely that Miro, lacking a firsthand acquaintance with the region he was describing, simply failed to distinguish between the Kansas River and its major tributary, the Republican. The Kansas Monument site is some 315 miles by water above the mouth of Kansas River, and at 2.6 miles per league this is not far from the figure Miró gives; by land, following the Kansas and Republican River valleys, the distance is approximately 225 miles.

The Pawnee village on the Republican is also mentioned in the journal of Trudeau in 1794 (Nasatir, 1952, vol. 1, p. 261). Here, despite an illegible word or passage, there seems to be a clear implication that the Republican Pawnee were living on a branch of Kansas River. At about the same time, Collot (1924, vol. 1, p. 279) gives a somewhat confused description of the location of these people; but his accompanying map has the "Republican N" (i. e., Nation) on the left bank of a northerly tributary of the Kansas River next above the Blue Water (Blue River). Later, in 1804, Lewis and Clark wrote that the Panias Republicans were an offshoot of the Grand Pawnee, having separated from the parent band "about ten years since" and established themselves "on a large northwardly branch of the Kansas, to which they have given name. They afterwards subdivided, and lived in different parts of the country, on the waters of Kansas river; but being harassed by their turbulent neighbors, the Kansas, they rejoined the Panias proper last spring."

As is evident from the foregoing review, Lewis and Clark were in error as to the history of the Republican Pawnee—at any rate, as regards the date of their separation and the time of establishment of their village or villages on the Republican River. The Republican Pawnee were certainly present as early as 1777 on the stream which has since borne their name; and since Pike in 1806, 2 years after Lewis and Clark wrote, visited a Republican Pawnee town on the Republican, not all of the tribe had left the stream by 1806. Sibley (1927, pp. 200–203), in fact, indicates in 1811, that the Pawnee town he visited that year on the Loup included two bands which had resided until 2 years previously on the Republican. Archeological investigations suggest that the Hill site and the Kansas Monument site, both safely ascribed to the Pawnee, were probably not far apart in time. Accepting the Hill site as the location of the Republican Pawnee in Pike's time, that is, after ca. 1800, it seems likely the Kansas Monument site dates from a slightly earlier period. Its abandonment may well have been due to heavy pressure from the perennially hostile Kansa living on the Missouri or, more probably, on the Kansas somewhere near the mouth of the Blue. Whether the inhabitants of that village moved upriver to the Hill site, or whether the latter represents another community that held out longer, is not yet clear. Final solution of this problem will have to be made on the basis of fuller archeological evidence from both sites, as yet not presented in full detail. Meanwhile, I think it can be safely said that the only certainly identified historic Pawnee village site located to date within the present limits of Kansas is the Kansas Monument site in Republic County, and that this site is without doubt attributable to the Republican Pawnee of the late 18th century, that is, after ca. 1775. If other earlier, contemporaneous, or later Pawnee sites of post-Coronado times exist elsewhere in the State, they remain unrecognized, undiscovered, or unreported.

## THE WICHITA

Undoubtedly long resident in the State, the Wichita have frequently been identified by historians and ethnologists with the natives of Quivira, who were met by Coronado in 1541 and by Oñate in 1601.

The location of Quivira itself has been debated for years; but its identification with the great bend region of the Arkansas River in central and southern Kansas now seems established beyond successful contradiction (Jones, 1929, 1937; Wedel, 1942; Bolton, 1949, pp. 282–304). This, then, places the Wichita in the heart of Kansas in the mid-16th century. How long they had been there when the first Spaniards arrived, we have as yet no good basis for judging, nor is it clear how long after Oñate's visit they continued their residence in the region.

Identification of the natives of Quivira with the Wichita has been based primarily on the close similarity between the mode of life and material culture reported by Coronado and Oñate, on the one hand, and what is known of the Wichita tribes, on the other. At least two of the accounts left by members of the Coronado expedition—that of Coronado himself and that by Jaramillo—are those of eyewitnesses and thus of prime importance. The anonymous Relación del Suceso, which Bolton (1949, p. 283) is inclined to attribute to Alvarado, also gives indication of being a firsthand narrative. The lengthy account by Castañeda is at secondhand insofar as it relates to Quivira, since the writer did not accompany Coronado and his select band to the Arkansas valley.

According to these several accounts (Hammond and Rey, 1940), Quivira included not more than 25 towns; Jaramillo says 6 or 7, Castañeda only that the country is "well settled." Some of the towns were said to include 200 houses, clustered together. The houses were of various sizes, but mostly round and of straw. On the outside, "they had a sort of chapel or sentry box with a doorway where the Indians were seen either seated or lying down. . . ." Other structures, grass roofed but without walls and likened to pile-dwellings, suggest arbors or ramadas. Coronado commented on the stature of the Indians and the comeliness of the women; and by comparing the latter with Moorish women in appearance, he may be implying that they were tattooed. These natives, besides hunting buffalo, cultivated maize, beans, and squash; they had no cotton or domestic fowls, nor is there mention of dogs. Bread was baked under the ashes. Except for a copper breastplate and "some copper jingle bells," there was no metal. Beyond Quivira, but not visited by the Spaniards, were other settlements including, according to Jaramillo, "Arahey, with the same customs, settlements, and size as the former [i. e., Quivira]." The Relacion del Suceso says the Spaniards were told of "two other large pueblos one called Taraque and the other Arae. The Taraques have straw houses; the Araes some of straw and the rest of hides." Arahey, or Harahey, has often been interpreted as an allusion to the Pawnee, or possibly to the Arikara (see also Lesser and Weltfish, 1932).

Oñate's observations 60 years later give parallel and additional information (Bolton, 1916, pp. 259–264). The "gran poblacion" he visited in Quivira in 1601 is said to have consisted of 1,200 houses scattered on both sides of a stream flowing from the north into a larger east-flowing river. Circular in form, the houses were constructed of poles covered with grass. The Spaniards were impressed by the abundant crops of maize, and noted also beans and calabashes. They were informed that large numbers of people like these lived farther up the river. Testimony given by members of the expedition in Mexico City in 1602 (Scholes and Mera, 1940, p. 274) included the information that—

> the huts were grouped in barrios of 30 or 40, the huts being about 30 to 40 paces apart, and . . . the barrios were separated by two or three hundred paces. Surrounding each hut was a small cultivated plot where maize, beans, and calabashes were raised . . .

The Indians, it was further reported, wore clothing of deer and buffalo skins, had no textiles, used metates, made pottery of brown clay and small dishes from calabashes, and apparently possessed a few small dogs.

All this briefly describes a way of life essentially like that followed by the various semisedentary Wichita tribes visited farther south on the Brazos, Trinity, and Red Rivers by De Mezieres in the 18th century (Bolton, 1914, vol. 1, pp. 285–296; and vol. 2, pp. 192–204); and also one still more or less characteristic in the late 19th century (Dorsey, 1904, pp. 4–6). Unfortunately, nothing resembling the name Wichita itself appears in any of the documents left by the Coronado and Oñate expeditions; but a few of the local Indian words transcribed by the Spanish chroniclers seem to offer some linguistic support for identification of the people of Quivira with a Wichita group or groups (Lesser and Weltfish, 1932, esp. pp. 10–15). Thus, according to Bolton (1949, p. 293), there is eyewitness testimony "that the last settlement reached by Coronado was called Tabas, which is but another spelling of Towash [cf. Tawehash], or Taovayas, the well-known name of a Wichita group at a later date." He also suggests that the word "*teucarea*," which Jaramillo uses in describing "the remotest region of Quivira" (Hammond and Rey, 1940, p. 304), is a "mistranscription of taovaias—that is, Taovaias or Towash." Hyde (1951, p. 19), on the other hand, is inclined to regard *teucarea* as synonymous with Touacara or Toucara, which later became Tawakoni, the name of another tribe closely related to the Wichita of history. He goes on to argue from this and other evidence that the Wichita proper, whom he apparently regards as originally an earth-lodge-using people, cannot be identified with the grasshouse natives of Quivira.

In the present state of our knowledge, it seems to me a fruitless quibble over the point whether the 16th century Quivirans can accurately be called Tawakoni, Towash, or Wichita. If there is any validity in Bolton's linguistic arguments, it appears that the first two of these terms are the only southern Caddoan tribal names that have much claim to identity with anything linguistic that appears in the Coronado documents. Both terms can be recognized in the lists of Wichita band names given by Mooney (Hodge, 1907–10, pt. 2, p. 947), who includes the Wichita proper as questionable, and by Lesser and Weltfish (1932, p. 10), where nothing resembling Wichita appears. It is possible, I suppose, that there was no Wichita band, as such, in the 16th century, or that it was a relatively small and unimportant group at the time which became prominent or dominant only in later years, or that it was synonymous with one of the two groups named above. In any event, the Tawakoni, Tawehash and/or Wichita (see Schmitt and Schmitt, 1952, p. vii) appear to have been closely related linguistically and also closely associated in later historic times, whence they came to be collectively known and designated as the Wichita or the Wichita confederacy. In the present discussion, particularly so far as it relates to events prior to the mid-18th century, I have chosen to continue this broadly inclusive, or "loose," meaning of the term Wichita.

For a century or more following Oñate's visit to Quivira in 1601, references certainly to the Wichita are distressingly meager. So far as I have been able to determine, the name "Wichita" or anything resembling it very closely, does not appear in the available published documents until La Harpe's mention of the Ousita in 1719 (Margry, 1886, pt. 6, p. 289). There are, however, a number of other names and appellations by which the Wichita and cognate tribes were known at various times, and some of these offer clues to the whereabouts and movements of these people. According to Mooney (op. cit.), the term Wichita itself is of uncertain origin and etymology (cf. Lesser and Weltfish, 1932; Haas, 1942; Schmitt and Schmitt, 1952, p. vii); but he observes further that the Wichita were "known to the Siouan tribes as *Black Pawnee* (Paniwasaba, whence 'Paniouassa,' etc.), to the early French traders as *Pani Pique*, 'Tattooed Pawnee,' to the Kiowa and Comanche by names meaning 'Tattooed Faces,' and are designated in the sign language by a sign conveying the same meaning . . . from their abundant tattooing they were designated preeminently as the 'tattooed people' in the sign language." This practice, too, strongly implied in Coronado's report on the natives of Quivira and explicitly mentioned in the documents relating to Oñate's observations, resulted in application by the Spaniards of the term Jumano or Jumanes to the Wichita. As Scholes has shown (Scholes and Mera, 1940, pp. 271–276), this name was much used in early New Mexico for "widely separated tribes and settlements of different linguistic and cultural affiliations"; it seems, in fact, to have been "a general term for all *indios rayados*," that is, Indians whose body decoration included pattern tattooing, dyeing, or painting. In the 18th century, according to Bolton (see Hodge, 1907–10, pt. 2, p. 705), the Tawehash were specifically referred to by the Spaniards of New Mexico as the *Jumanos.* Evidently, then, any interpretation or evaluation of early documentary references to Jumano or Jumanes in the Plains east or northeast of Santa Fe must take into consideration the strong possibility that Wichita peoples are involved.

There appear to be at least two Spanish allusions to Quivira during the 17th century which suggest that the country so known was still in the Kansas region or immediately to the south. According to the Benavides Memorial of 1630 (Ayer, 1916, pp 58–64), the Xumana nation lived more than 112 leagues east of Santa Fe, beyond the Apache Vaquero; 30 or 40 leagues farther, in the same latitude as Santa Fe, was the Kingdom of Quivira. Here, a distinction seems to have been made between the Xumanas and Quivira; but if the distances and directions given are anywhere near correct, they suggest that the latter "kingdom" was understood to be somewhere in the Canadian or Cimarron valleys of northern Oklahoma. Hodge's suggestion (Hodge, 1907–10, pt. 1, p. 636) that the main body of the Jumano in 1629 seems "to have resided 300 miles east of Santa Fe, probably on the Arkansas, within present Kansas," where he says they appear to have been also in 1632, runs afoul of the fact that the Arkansas cannot be reached eastward from Santa Fe in less than 500 miles. His subsequent view that these Jumano may have been in the El Cuartelejo region of western Kansas (Hodge, 1910, p. 259) has since been shown by Bolton (1911, p. 69) to be untenable, since there is good documentary evidence that these people were then on the Nueces River in Texas.

Later in the century, after 1664 but before the Pueblo Revolt in 1680, several families of Taos Indians fled eastward to the buffalo plains and fortified themselves in a place thereafter termed El Cuartelejo. They were brought back to the Rio Grande by Archuleta (Thomas, 1935, p. 53), who "found in the possession of these rebellious Taos kettles and other pieces of copper and tin. Having asked them where they had acquired these, they answered from the Quivira pueblos, to which they had made a journey from El Cuartelejo." Moreover, by way of Quivira, "one goes to the Pawnees," with whom the French were reported to be then trading. Whether reference here is to the Nebraska Pawnee or to the Paniouassa farther south, I do not know; in either case, location of the Quiviran peoples in the Arkansas drainage of central Kansas would fulfill the geographic relationships implied.

French maps of the latter 17th century are apparently confirmatory of this supposition. Thus, as we have elsewhere indicated, the Marquette and Jolliet maps of the lower Missouri River region, show the Paneassa west and southwest of the Osage, Missouri, and Kansa. Somewhat later, the Franquelin map of 1684 shows the Paneassa in 10 villages west and south of the Missouris and Zages (Osage), some distance north and east of the Arkansas River. Unfortunately, there appear to be no other documentary materials which would enable a more precise evaluation of these map locations.

By the first quarter of the 18th century the Wichita tribes, or a considerable portion of them, had evidently moved southward and were coming into the French sphere of influence. Their first recorded meetings with the French seem to have been in 1719. In that year La Harpe (Margry, 1886, pt. 6, p. 289) made an alliance with eight or nine bands residing in a string of villages on a southwesterly tributary of the Arkansas, which Bolton (1914, vol. 1, map) evidently takes to be the Canadian near its confluence with the North Canadian. In a footnote to La Harpe's account, Beaurain (Margry, 1886, pt. 6, p. 289) says that these nine villages were allied with the Paniouassa living 40 leagues to the north. One is tempted to speculate that these Paniouassa of Beaurain may have been the Panioussas or Panis village visited in the same year by Du Tisné (Margry, 1886, pt. 6. p. 314), who reached them overland from the Missouri River at 4 days distance (La Harpe, op. cit., p. 311, says 40 leagues) southwest of the Osage villages on the upper Osage.

The Beauvilliers map of 1720 (orig. in Bibl. du Dept. de la Marine, Paris. C. 4040 (7); photostat in Library of Congress), which relates directly to the French explorations of this period, shows the Arkansas River with two large forks. The "9 Nations . . ." with whom La Harpe treated are shown on or near a short tributary of the south fork, which is designated the "Atcantca R." On the north fork, labeled "R. decouverte en 1720," and which, if not actually to be identified with the Arkansas itself, could be the Neosho or Grand, are the Panis with 290 warriors. Between the forks, but northwest of the tribes just noted, are shown "Villages Ascanis et Ousita." It is manifestly impossible to ascertain accurately, from either the narratives or the map, just where the various tribes were located; but it seems very probable that the nine nations met by La Harpe were, as Bolton suggests, on the Canadian in east-central Oklahoma (see Wright, 1951, p. 247, for a different view). The other tribes must then have been to the north and northwest in the Arkansas drainage, but whether in northern Oklahoma or southern Kansas is impossible to say. It has been customary to identify Du Tisné's Panis villages with some locality near present Vinita, Okla.; but there is a growing feeling among archeologists that two early, and manifestly important contact village sites situated on the Arkansas just south of the Kansas line in Kay County, Okla., may actually be the correct location (Bell and Baerreis, 1951, p. 91; see also Steen, 1953, pp. 177–178.).

That Wichita tribes were still residing in the western and northern portions of the Arkansas drainage in the first half of the 18th century is also suggested by bits of information from the Spanish in New Mexico. In 1706, for example, Ulibarri reported that the Plains Apache northeast of Santa Fe were under attack by the Pawnee allied with the French, and also by a combination of Comanche and Jumano. The latter, Thomas (1940, p. 6) thinks, were the Taovayas along Red River, who on later occasions were known to have joined forces with the Comanche against the Lipan. Since Ulibarri's report gives no indication as to location of these Jumano, or Wichita, if such they were, it seems possible that they were actually located farther north than Thomas suggests. A few years later, in 1719, Valverde reported the French in alliance with the Pawnee and Jumano against the Apache. Still later, but prior to 1750, a Spanish force under Bustamente in pursuit of the Comanche, marched down the Arkansas to the vicinity of the Jumano villages (Bolton, 1914, vol. 1, p. 48; Thomas, 1940, p. 17). Again it is not apparent just where these were situated. The Delisle map of 1718 has the Paniassa on the left bank of the Arkansas, near two short tributaries entering from the north, and south and southwest of the Osage. The Popple map of 1733, where tribal names are generously used, also locates the Paniassa on the Arkansas, with another location on the upper Red River. Excepting the Red River location, one wonders whether these representations, like that on the Beauvilliers map of 1720, are perhaps to be correlated with the Neosho-Arkansas River locality. Archeological as well as further documentary data may throw additional light on this interesting problem.

By the latter half of the 18th century, most or all of the Wichita tribes seem to have been on the Red River and southward on the upper Brazos, Trinity, and other river valleys of north-central Texas. Here they were visited in 1772 by De Mezieres (Bolton, 1914, vol. 1, pp. 284–302), whose roster of tribes met includes the Quitseys (Kechi), Iscanis (Waco), Tuacana (Tawakoni), Ouedsitas (Wichitas), and Taouaiazes (Tawehash). As Norteños, or Indians of the North, the Tuacana, Quitsey, and Toauyaces among others are again mentioned by De Mezieres (Bolton, 1914, vol. 2, pp. 172–175) in 1778 as prospective allies against the Eastern Apache or Lipanes who, along with the Osage, were their implacable enemies. Writing from San Antonio early in the same year, Bonilla (Bolton, 1914, vol. 2, p. 164) stated that some of the Indians of the North "have been known in this province since the latter part of the past century, when the first entry or discovery was made." A promising beginning on the archeology of the Wichita in Texas, concerned specifically with locations identifiable with certain of Bolton's historical determinations of the 1770's, has already been made (Krieger, 1946, pp. 161–164).

The documented hostility of the Apache on the west and the Osage on the east toward the Wichita in the 18th century suggests an important factor in the steady southward withdrawal of the latter. With regard to the Osage, it also raises some doubts concerning another reference supposed to pertain to Wichita peoples north of the Arkansas in the latter 18th century. In a report on the Wichita in 1877, the Indian agent (Williams, 1877) stated that "The Wichitas, Wacoes, and Tawaconies are virtually one people, speaking the same language, the names of Wacoes and Tawaconies being given to the descendants of two bands of Wichitas, who about 100 years ago, left the main tribe on the Neosho River, in Kansas, one taking up a residence on the Arkansas River, near the present town of Wichita, and the other pushing on to Texas. . ." This may be another hint that the Neosho drainage was perhaps an important part of the Wichita habitat as late as the 18th century; but in view of the bitter warfare waged against the Wichita all through that century by the Osage, the Neosho River in Kansas would seem to have been a most undesirable locality for permanent Wichita towns as late as 1777.

During the closing decades of the 18th century and on into the 19th, the Wichita tribes continued to reside in the upper Red and Brazos River valleys, far south of their old Kansas habitat. They clung to many of the old ways, including the dual subsistence economy by which their interests were divided between hunting and horticulture; and they were on amicable terms with the Comanche. In 1805, the Wichita proper and the Tawehash were reported to be living in two villages on Red River about 800 miles above Natchitoches. Subsequent moves took them to the North Fork of Red River west of the Wichita Mountains in present Kiowa County, Okla., where they were visited in 1834 by the United States dragoons under Dodge and accompanied by Catlin; to the east end of the Wichita Mountains in the vicinity of present Fort Sill; to Rush Creek in the Washita drainage, where Marcy found them in 1852; and ultimately, in 1859, to lands assigned them farther up the Washita in present Grady and Caddo Counties. Here they were joined by the Tawakoni, Waco, and other Indians who had remained on the Brazos in Texas. Their first agency was on Leeper Creek north of the Washita; Fort Cobb was shortly established about 4 miles to the southwest (see Wright, 1951, pp. 258–259; Schmitt and Schmitt, 1952, pp. vii–ix).

In 1863, finding themselves at odds with their proslavery Indian and white neighbors, the Wichitas left their homes along the Washita and fled north to Free-State Kansas Territory. Here, according to Mead

(1904, pp. 172–175), they "built their town of grass houses at the junction of the two rivers, Big and Little Arkansas, or 'Neshutsa,' and 'Neshutsa Shinka' of the Osages, in whose territory it was located, which became known all over the plains as 'the Wichita town,' and on their village site has arisen the third [sic] largest city in the state, Wichita." A temporary camp was established in the summer of 1863 in dense timber at the mouth of the Little Arkansas, "just across from the present Murdock avenue bridge." By the next summer, "grass houses were built in groups along the Little [Arkansas] river for a mile, on the east bank"; and the women had cleared ground and planted gardens along the stream. Here they grew corn, pumpkins, melons, and Mexican beans, in plots protected by fences made of small upright poles. Mead, who established a trading post among the newcomers, has left brief but interesting comments concerning their customs, including an excellent description of the lodges. Buffalo were still plentiful to the west, and with horses given them by the Comanche, the Wichita drew on the herds as well as on their gardens. Interestingly enough, he observed too that "many of the older women were artistically tattooed in pink and blue zigzag circles and lines, as was their ancient custom." Apparently, each of the several bands lived more or less separately, though the context here is not clear.

This final sojourn of the Wichita tribes in Kansas was destined to be a short one. In 1867, cholera reached them by way of American troops (Mead, 1904, p. 176), and the Indians suffered heavily. In accord with orders from Washington calling for their return to the Washita, the Wichita moved southward along the Chisholm Trail. Decimated by disease, winter weather, and inadequate food supplies, they finally reached their destination in the vicinity of present Anadarko, Okla. Here, as the "Wichita and Affiliated Tribes," they have since resided.

## ATHAPASCAN AND SHOSHONEAN PEOPLES OF WESTERN KANSAS

West of the regions in Kansas for which Caddoan and Siouan occupations can be historically demonstrated was formerly the habitat of various wandering peoples of alien affiliations, notably the Apache and Comanche. The former, of Athapascan linguistic affinities, were clearly the earlier inhabitants. Their representatives were met by the first Spanish exploring expeditions eastward from the upper Rio Grande; they were present in numbers throughout the 17th century, and evidently dominated much of the western Plains from the upper Rio Grande northward at least to the upper Platte valley until well into the 18th century. The Shoshonean-speaking Comanche first appear on the pages of history about the year 1700. Adapting themselves readily from a mountain-based to a nomadic Plains life and taking over the horse, they steadily expanded their range at the expense of the Apache. By the middle of the 18th century, they had swept the latter from the Plains north of the Canadian. The Comanche likewise drifted steadily southward through the High Plains, so that by 1800 or soon after, they were sharing the upper Arkansas valley and territory to the north with the Kiowa, Arapaho, and Cheyenne, and still later with Dakota Siouan and other tribes.

## THE PLAINS APACHE

Under this term are included a number of peoples variously designated by the 16th-, 17th-, and 18th-century Spaniards, and sometimes collectively known as the Eastern, or Prairie, Apache. Harrington points out that these were the easternmost of all the Apaches and suggests their general designation as Lipanans in contrast to the Apacheans, that is, Navaho and Apache proper (Harrington, 1940, pp. 509–512). Consistent with this view, he renames the Kiowa Apache the Kiowa Lipanan, possibly to be correlated with the old Paloma Apache; and he goes on to consider briefly other early historic Plains Apache under such terms as Cuartelejo Lipanan, Jicarilla Lipanan, Querecho Lipanan, Teya Lipanan, and the Lipan proper. This, in effect, substitutes the term Lipanan where Hodge (1907–10, pt. 1, p. 631) used the word Jicarilla in his earlier discussion of the Plains Apache. Wright (1951, p. 180) regards the Lipan as originally an offshoot of the Jicarilla and says they have been identified in reservation days with the Mescalero Apache in New Mexico.

The first allusions to the Plains Apache are found in the narratives of the Coronado expedition (Hammond and Rey, 1940). Fourteen days east of Pecos, near the Canadian River and the present Texas-New Mexico line, the Spaniards found encampments of roaming people they called Querechos. The several eyewitness accounts concerning these natives furnish a concise but clear picture of a pre-horse Indian economy in the southern plains. The Querechos, like the Teyas met soon after, lived "like the Arabs," says Castañeda; according to the Relación Postrera, the "maintenance or sustenance of these Indians comes entirely from the cows, because they neither sow nor reap corn." They followed the herds and in winter carried their stores of dressed hides to the settled Indian towns and bartered them for maize and blankets, "each company going to those which are nearest, some to the settlement at Cicuye [Pecos], others toward Quivira, and others to the settlements which are situated in the direction of Florida." Clearly indicated in the accounts is the restless life of these hunter folk, and there is mention of dog traction and the travois, the conical skin tipi, the breechcloth and skin clothing, the bow and arrow, pemmican, body painting or tattooing, sign language, and the use of articles and implements fashioned from bone, stone, buffalo hair, and sinew. The people were friendly and unafraid. Despite their trade contacts with the Pueblos, the Teyas were said by the Spaniards to have been responsible for the recent destruction of several pueblo towns between Tiguex and Cicuye, and even to have besieged the latter town.

Later Spanish explorations eastward from the Rio Grande added steadily to knowledge of the distribution and habits of these early plainsmen. One Jusephe, a deserter from the ill-fated expedition of Bonilla and Humaña in ca. 1593, was a prisoner among the Apache Vaquero for a year before finally making his escape to Picuris, where Oñate found him. In 1598, Oñate sent Zaldivar toward the east where he met numbers of Vaqueros, some of whom were returning from Taos and Picuris where they had traded meat, hides, and other items for cotton blankets, maize, pottery, and "some small green stones" (turquoises?). He described their tents as colored bright red and white, noted their heavy dependence on the buffalo, and was told that the Jumano were their enemies. In 1599, in a letter to the viceroy, Oñate mentioned the "Querechos, o baqueros," who lived near the buffalo herds. Two years later, on his march to Quivira, he met "Apachi" near the Canadian River; farther on, he met still more "people of the Apache nation, who are the ones who possess these plains," and spoke of their moving about with the herds. Approaching the Arkansas River in south-central Kansas, he presently encountered another populous tribe, who are elsewhere named by members of his expedition the Escansaques. They were enemies of the Quivirans living not far to the east, and subsequently turned against the Spaniards. Formerly regarded as the Kansa, there can be little doubt that these people, as described in the Oñate records, were actually another nomadic Apache group, very likely encamped in present southern Kansas.

The Benavides Memorial of 1630 (Ayer, 1916, pp. 39–57) suggests that by this time, nearly a century after their first meeting, the Spanish were deeply impressed by the presumed numbers, distribution, and valor of the Apache. Four principal groups are recognized and described in the Memorial—the Apache de Navaho, Apache de Xila, Apache de Perillo, and Apache Vaquero (see also the maps of Minet 1685, Coronelli 1688, and Delisle 1703, in Tucker, 1942, pls. 7, 9, and 13). Of these only the last-named concerns us here. The Apache Vaquero were said to inhabit the territory east of the Rio Grande, ranging "more than 150 leagues along the boundary of New Mexico and extending more than 100 leagues eastward." Again their heavy reliance on the bison is stressed. Planting is mentioned under the description of the Apache generally, and is specified for the Apache de Xila and Apache de Navaho; but it is not mentioned in the long discourse on the Apache Vaquero. In a footnote, Hodge (Ayer, 1916, p. 263) identifies the Apache Vaquero with tribes later known as the Jicarilla, Faraone, Lipan, Llanero, and Mescalero.

For the next 50 or 60 years, there appears to be little information concerning the Apache in the distant plains east and northeast of Santa Fe. To the difficulties facing the Spaniards in maintaining their long communication lines to Mexico and in holding the restive Pueblos under control was added the thorny problem of the nearer Apache, who were increasingly raiding the Spanish and pueblo settlements alike. Conditions worsened rapidly during the two decades preceding the Pueblo Revolt of 1680, partly because of severe droughts and food shortages. Some time during this period, a group of dissatisfied Taos fled to the buffalo plains of eastern Colorado or western Kansas from which they were brought back to the Rio Grande by Archuleta; the spot in which they had settled briefly and built houses thereafter was called El Cuartelejo, and this term was also applied to the nearby Apache whose slaves the Taos had become (Thomas, 1935, pp. 11, 264, n. 23). Unfortunately, there are no details regarding these Apache, thought by Thomas to have been living in the Arkansas drainage of eastern Colorado; and the record is silent as to how closely their manner of living resembled that of the Apache Vaquero of earlier days.

Following the reconquest of the pueblo area after the Revolt, the Spanish again came into intimate contact with the Plains Apache; and to their observations from this time on can be added those of the French, pressing toward New Mexico from the Mississippi Valley. Before 1700, news of the French in the lower Mississippi Valley was reaching the Spaniards by way of the Apache; and there are reports of Navaho journeys to Quivira and raids by them against the Pawnees and French (Thomas, 1935, p. 13). In 1706 Ulibarri marched northward from Santa Fe via Taos to the Cuartelejo Apache country beyond the Arkansas, where he rounded up 62 Picuris Indians who had been living there since 1696 and returned with them to the Rio Grande. Among the Xicarilla, Penxaye, and other named Apache in northeastern New Mexico and southeastern Colorado, Ulibarri found maize-bean-squash agriculture, as well as unrest over the threat of Comanche raids. In the Cuartelejo country, he visited or reported four or five rancherías, giving their names, and noting that they were widely scattered over some 40 leagues of land. More important, he noted also that "at the end of July they had gathered crops of Indian corn, watermelons, pumpkins, and kidney beans." The natives, though still unconverted to Christianity, wore crosses, medals, and rosaries. The Spaniards saw guns, metal kettles, and other items which had been taken from the French and Pawnee, and observed that from white men to their east, the Apaches "buy many iron things such as hatchets, swordblades, arquebuses, copper things." There appears to be no mention of horses among the Cuartelejo at this time.

Thirteen years later, Valverde in pursuit of Ute and Comanche hostiles, traveled northward and then east over substantially the same route taken by Ulibarri. In the valleys north and east of Taos and south of the Arkansas he found the Apache tribes growing sizable crops of maize, beans, and pumpkins; some of them practiced irrigation and lived in stone houses. He also heard of rancherías laid waste by the Comanche and Ute, whose war trails his expedition crossed. On the banks of the Río Napestle (Arkansas), he was met by a host of Cuartelejo Apaches—200 tents, and many dogs who drew their baggage. There is no clear indication of horses among the Cuartelejo. Valverde also interviewed an Indian with a gunshot wound, received in "the most remote borderlands of the Apaches," presumably to the north or northeast, when the "French, united with the Pawnee and Jumano attacked them from ambush while they were planting corn." Under pressure from the French and Pawnee, these northern Apache, whom Thomas (1935, p. 31) identifies as the Paloma Apache, had given up their old lands and were withdrawing to the Arkansas. Later testimony given by participants in one or both of these Spanish expeditions, when the suitability of El Cuartelejo as a frontier outpost was being evaluated, developed the fact that in that locality, "small returns can be expected, since the Indians, who ranch there seasonally, gather the scanty harvests which the place provides, and retire to other spots to pass the winters, which are rigorous, and where there is no supply of wood for many leagues . . ." (Thomas, 1935, pp. 157, 161, 173).

The Cuartelejo were visited again in the following year, 1720, when Valverde's lieutenant, Villazur, was dispatched northward from Santa Fe at the head of a force of about 100 soldiers, settlers, and Indian allies to ascertain the exact location of the French. Proceeding via El Cuartelejo, Villazur reached the Platte in present Nebraska after a march of some 60 days, or approximately 300 leagues, where he and a large part of his command perished at the hands of the Pawnee and their allies, presumably including some Frenchmen. The survivors were rested and fed at El Cuartelejo on their flight to Santa Fe.

As elsewhere indicated, the heart of the Cuartelejo and Paloma Apache territory in the first quarter of the 18th century, as the contemporary Spanish knew it, is identified by Thomas with eastern Colorado, extending northward probably as far as the South Platte

River. Inferentially, however, it must have included a considerable tract to the east, well into Kansas and southwestern Nebraska, where these or related peoples had their habitat beyond the direct reach of Spanish expeditions. Other Apache groups doubtless lived farther south, on the westerly tributaries of the lower Arkansas River. It was these easternmost Apache with whom the French first came into contact during their attempts to reach the Spanish territory overland from the lower Mississippi-Missouri area early in the century. Their westward passage across the plains was blocked by warlike peoples whom they called the Padouca. These are shown on numerous French maps, usually in essentially the same region as is ascribed by the Spanish to the Plains Apache, and apparently beginning as early as the Delisle 1718 map of Louisiana. A possible variant of the term appears even earlier on the Franquelin map of 1684, in which the "Riviere des Parouke" is shown.[10]

Not much information is available from the French regarding the Padouca, at any rate as compared with what the Spanish tell us about the Apache; but they are usually described as the implacable enemies of the semisedentary tribes living along the lower Missouri, the Arkansas, and their western tributaries. Bourgmond in 1717 spoke of the "Padauccas" as the allies of the Pawnee and Panimaha on the Platte. At about the same time, Le Maire wrote that "The Spanish who go toward the Missouri fear to be robbed by the Apaches or Padoucas on horseback, who are the Arabs of this area." Du Tisné visited the grand village of the Padouca in 1719, noting their warlike nature, use of leather armor for their horses, and of the bow and arrow as weapons. In the following year, Boisbriant wrote of the dilemma in which the French found themselves with respect to the Padouca, stating that if peace were not made with them, the French would have to give up all hope of "reaching New Mexico by crossing the vast country roamed over by the Comanches [sic], a name under which the Padoukas are known." In 1724 Bourgmond finally made peace between a Padouca band and the Kansa in east-central Kansas; his brief description of their mode of life, with limited maize agriculture and some pottery, is reminiscent of the Spanish accounts concerning the Apache of the same period. Except in his mention of horses, there is no marked disagreement between this description by Bourgmond and the fuller accounts by Valverde and Ulibarri concerning the Cuartelejo and their neighbors farther to the west. (See Champe, 1949 a, p. 291, for a different view.)

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[10] The Homann map cited by Secoy (1951, p. 525) as "one of the earliest definite examples" of the use of the word Padouca is much later than the date of 1687 he assigns it (Lowery, 1912, p. 333); and for the Plains area it obviously draws on the Delisle map of 1718, which utilizes geographic and ethnic data gathered by Bourgmond between 1714 and 1717.

The Cuartelejo and neighboring Apache peoples northeast of Santa Fe figured more or less in Spanish frontier affairs for another decade or two after the time of Valverde and Bourgmond; but the records show that, under growing pressure from the Comanche and Ute on the west, theirs was an increasingly unhappy existence here in the upper Arkansas and nearby drainages. In 1726 a group of Escalchufines and Palomas fleeing from the Comanche reached New Mexico and informed the Spaniards that among their pursuers were some French. Thomas (1940, p. 14) suggests that these may have been from Bourgmond's expedition of 1724 or from a later party of Frenchmen who 2 or 3 years after were reported to have ascended the Arkansas in search of the Padouca (Bolton, 1914, vol. 1, p. 58). In 1728 Governor Bustamente passed on to the viceroy another Apache report that several Frenchmen had established themselves at El Cuartelejo; and, further, that some of these "went with a great force of Apaches of the nations Palomas, Cuartelejos, and Sierra Blancas to look for the Comanches (a people widely scattered because of the numerousness of their nation) to see if they could force them to leave these regions . . ." (Thomas, 1935, pp. 256–258). The Comanche, he noted, were then "in El Almagre or a little farther away," that is, somewhere in the area of the Front Range of Colorado (Thomas, 1935, p. 283; see also 1932, map opp. p. 1).

In the next 10 years, the expulsion of the Plains Apache from the territory northeast of Santa Fe by the Comanche appears to have been completed, for when the incompletely documented Mallet brothers' expedition in 1739 passed through the Platte and upper Arkansas country, they encountered only the Laytanes, or Comanche, in the region (Margry, 1886, pt. 6, p. 455). According to Bolton (1914, vol. 1, pp. 24–25):

> Till after the opening of the 18th century the Apache tribes, especially the Lipan, regarded as their own the territory from the upper Nueces and Medina Rivers to the upper Red and Colorado, while their range between summer and winter might cover many hundred miles. . . . About 1700 [the Comanche] reached New Mexico and the Panhandle country. Next they attacked the Apache and crowded them southward, destroying the extensive Apache settlements of southwestern Kansas, and occupying the northern Apache lands themselves. . . . By the middle of the [18th] century the more usual haunts of the Lipan were the districts about the San Saba River, in west-central Texas, while the upper Colorado, Brazos, and Red Rivers were in the hands of the Comanche. At this time the Carlanes, who early in the century had lived in southwestern Kansas, the Chilpaines, Palomas, Pelones, Faraones, and Natages, were all living southeastward from Santa Fe in what are now eastern New Mexico and western Texas.

That part of the old Apacheria with which we are here primarily concerned, including western Kansas and adjacent regions, had in other words become part of the new Comancheria.

With respect to Kansas, then, Plains Apache peoples appear to have held the western third or more from perhaps the earliest white contact times until the first quarter of the 18th century. As Kroeber (1939, p. 37) notes, "they were thus part of the tribes within the old, pre-horse, Plains culture." It is at present only an inference, but perhaps a not unreasonable one, that peoples following the Querecho-Teya-Vaquero type of subsistence economy were present in the Arkansas drainage and northward in the 16th century and probably earlier, since there are no eyewitness accounts for the plains north of the Canadian River during that time. When details concerning the northerly regions become available, principally after the Pueblo Revolt in 1680, it is a partly hunting, partly horticultural subsistence economy that is revealed. The contemporary accounts, moreover, suggest strong puebloan influences on the Plains Apache who were closest to the pueblo towns; farther away, irrigation and stone houses among the Apache are not mentioned, and cultivation seems to have been progressively less intensive. To what extent puebloan fugitives from the Rio Grande, before and after the Revolt of 1680, may have been instrumental in introduction of maize agriculture to the Plains Apache I am unable to say. What does seem clear is that this partly horticultural basis of life, but with cultivation less strongly emphasized than among the village Indians to the east or the Pueblos to the southwest, lingered on until the southward dispersion of the Apache following the time of Valverde and Bourgmond. Thus, among the archeological materials of the late 17th to early 18th centuries from western Kansas, it is reasonable to expect some evidence of the Plains Apache. Such evidence has in fact already been found and reported, in Kansas and Nebraska, as the Dismal River culture (Strong, 1935, pp. 212–217; Wedel, 1940, p. 323; Hill and Metcalf, 1942; Champe, 1949 a). We shall return in another place to a discussion of this problem (p. 590).

### THE COMANCHE

The Shoshonean-speaking Comanche, in alliance with the Utes against the Spaniards and Pueblos, make their first certain appearance in documentary history shortly after 1700 (Thomas, 1935, pp. 61, 262, n. 8), when Ulibarri reported that the two tribes were about to attack Taos. Their home then appears to have been in the mountain valleys to the northwest, presumably around the headwaters of the Arkansas River. Earlier the Comanche must have resided with the closely related Shoshone yet farther to the northwest—perhaps, as Shimkin (1940, p. 20) suggests, in the Snake River drainage of southern Idaho, northern Utah, and western Wyoming. From this ancestral homeland, the Shoshone supposedly spread north and northeast, the Comanche southeast—first, as a mountain-based hunting and gathering people, later as full-fledged wide ranging Plains bison hunters. Unfortunately, there are no contemporary documents for the Wyoming-Nebraska region from which a possible Comanche spread into the Plains there can be considered.

Acquiring horses early in the 18th century, the Comanche promptly embarked on a career of alternate raiding and trading vis-a-vis the Spaniards and Pueblos and of almost constant warfare against the Plains Apache northeast of Santa Fe. The story of their expulsion of the latter from the plains of the upper Arkansas is vividly sketched in the Spanish documents presented by Thomas (1935, 1940).

During the second quarter of the century, their destruction of the Plains Apache settlements in eastern Colorado and western Kansas was completed. By midcentury, the Apache from this region had been pushed far to the south—the Lipan, according to Bolton (1914, vol. 1, pp. 24–25), into west-central Texas, the Carlana, Paloma, and others into west Texas and eastern New Mexico southeastward from Santa Fe. The High Plains from the upper Colorado River of Texas northward to the Platte in Nebraska, and the Colorado piedmont fronting the Rockies, were firmly in the hands of the Comanche. It was presumably the Comanche, under the name of Laitanes, whom the Mallet brothers met, probably somewhere on or near the upper Arkansas, in 1739. A few years later, the French engineered a treaty between the Comanche and Jumano (Wichita) along the Arkansas, both tribes bitter enemies of the Apache; and by 1748 it was reported that there were 33 Frenchmen in La Jicarilla, selling guns to the Comanche in the former Apache stronghold. In addition to dispossessing the Apache from their old lands, the Comanche also acquired the name Padouca by which the French had known the Apache. They were so known to the Pawnee, according to Pike (1810, app. pt. 2, p. 17), as well as to various Siouan and other tribes.

The heart of the Comancheria of the latter 18th century and later evidently lay south of the Cimarron (Wallace and Hoebel, 1952, p. 8), but the Comanche also ranged well to the north of that stream until the 19th century. In 1787 the Spaniards in New Mexico almost persuaded a large Comanche band to settle permanently on the upper Arkansas near present Pueblo, Colo., even going so far as to send carpenters, erect houses, and furnish livestock and seed for farming; but before the following spring the attempt ended in failure (Thomas, 1929). In 1806, Pike saw unidentified Indian traces which he suspected were Comanche on the upper Arkansas; and he recommended establishment of one of two trading posts for them "near the mountains on the Arkansas" (Pike, 1810, app. pt. 2, p. 53). Comanche war and trading parties evidently traveled far to the north even after that time, where they came into contact with such northern tribes as the

Pawnee, Arikara, and others; but they no longer held undisputed control of the region north of the Arkansas. The accounts of Long's expedition of 1820 indicate that the Arapaho and Cheyenne had by that time moved into the region of western Kansas and eastern Colorado, and were occasionally ranging even farther south. From this time on, the Arkansas seems to have been the approximate northern limit of Comanche territory and much of this range north of the upper Red River was shared with the Kiowa and Kiowa-Apache. It was these three tribes particularly who, in later days, harassed the wagon trains on the Santa Fe trail south of the Arkansas River crossing.

That the warlike and aggressive Comanche were influential factors in the early post-White history of the western Plains is, of course, obvious; and their movements unquestionably are, and will be, strongly reflected in the later archeological developments in the western Kansas region. It seems improbable, however, that their stormy passage through this region has left remains of their own which will figure significantly in the archeological picture. All extant accounts stress their highly mobile and nomadic way of life, based almost exclusively upon hunting and gathering, with portable habitations of skin and poles. So far as I am aware, there is no authentic report of maize growing, pottery making, or semipermanent architecture among the Comanche, or of prolonged residence in any given locality by these people. Their campsites, thus, would be extremely superficial, except perhaps in the case of unusually favorable spots frequently used over a period of years. Absence of the trait complexes and practices just enumerated leaves little or nothing on which the archeologist can hope to lay his spade. The chances seem remote, therefore, that archeology in Kansas will be able to define a material culture complex that can be definitely identified as a Comanche manifestation.

## THE PADOUCA

The name Padouca figures prominently in the 18th and early 19th century literature on the western Plains; and the identity of the tribe, or tribes, to whom it was applied at various times and by different writers has been discussed so often that extended comment here is unnecessary. As Grinnell and others have indicated (Grinnell, 1920; Hyde, 1934, pt. 2, pp. 18–25, and 1951, pp. 278–281; Strong, 1935, pp. 25–26), there is some confusion in the way the term was used by contemporary observers and a good deal more in its interpretation by later students. From this confusion, however, two points seem to emerge. For one thing, it is fairly clear that the term Padouca was applied in the 19th century by Siouan (Mooney, 1896, p. 1043; Fletcher and La Flesche, 1911, p. 101) and other (Michelson, 1921) tribes to the Comanche. Equally clear, I think, is the fact that the same, or a similar, term was generally used by the 18th-century French, on maps and in other documents (see, e. g., Margry, 1886, passim, and Villiers, 1925), in reference to the tribes whom the Spaniards in New Mexico knew as the Plains Apache. That these were all actually Apache-speaking peoples cannot now be proved, of course; the term may have been used sometimes to include groups following the Apache manner of life but having other linguistic affiliations. As the evidence long ago assembled by Grinnell should have made clear to all of us, however, the most reasonable interpretation at the moment—and the one I have accepted in the foregoing pages—seems to be that the name under which the Plains Apache were known to the French and their Indian allies before circa 1750 was transferred after that time to the people who displaced the Apache, namely, the Comanche. In the most recent review of the Padouca problem, Secoy (1951, pp. 525–542) comes to this conclusion, which I think Grinnell almost reached; but Secoy's presentation is marred by a regrettable misuse of cartographic evidence, by a series of undocumented assertions regarding sources of geographic and ethnohistoric information, and by specious arguments from insufficient, doubtful, or irrelevant premises.

## OTHER TRIBES IN WESTERN KANSAS

There remain for brief consideration here a few other tribes that ranged in historic times through parts of western Kansas. These include especially the Kiowa, Kiowa Apache, Arapaho, and Cheyenne. During their documented sojourn in this region, all were evidently nonagricultural bison-hunting peoples. With the possible exception of the first two, they were generally late arrivals in the area and presumably left little or no imprint on its archeology.

### THE KIOWA AND THE KIOWA APACHE

The Kiowa, once classed as an independent linguistic stock, are now regarded as related to the Tanoan-speaking peoples of the Southwest. According to long-held views first propounded by Mooney (1898, pp. 152–168), they migrated in ancient times from the upper Missouri-Yellowstone country of southwestern Montana eastward to the Black Hills, whence the Dakota claimed to have driven them south to the Platte. Under pressure from the Arapaho and Cheyenne, they continued to drift southward across the Arkansas, and finally established themselves in the region between the upper Red and upper Arkansas Rivers. Here they came into close association with the Comanche, and were on friendly terms also with the neighboring Wichita tribes. Mooney discusses at some length their relationships with various northern tribes, including the Crow, Hidatsa, Mandan, Arikara, and others, and it is evident that they were well known to the Northern Plains peoples. Tabeau, about 1803, mentions them at the Indian gathering place in the Black Hills (Abel, 1939, p. 154). Their claim to a northern origin has been challenged, however. On linguistic grounds, Kroeber (1939, p. 48) suggests that the Kiowa are apparently "a group that anciently broke away from the Tanoans of the Rio Grande—somewhat like the Comanche from the Shoshone much later on." More recently, Lowie (1953, pp. 1–4) has pointed out that there is no valid proof of their prolonged northern residence or of close association with the Crow; traditions of such a northern stay he is inclined to regard, as Kroeber (1939, p. 80) apparently does, as reference to a "temporary northward migration, preceded by southern residence and followed by a return to the south." Further, he characterizes them as a distinctly southern Plains tribe, linguistically and by known residence. That they were perhaps somewhere in the Southern Plains during the period when Mooney would have them moving southward from the upper Missouri country would seem to be indicated if the Manrhoat of La Salle in 1682 were actually the Kiowa, as some apparently feel. In his summary of tribal history in the plains-prairies, Kroeber (1939, p. 86) suggests that three to five centuries ago the Kiowa may have been among the southern Athapascans, i. e., Plains Apache, or northward, which seems reasonable. Their early history, however, like that of some other wandering Plains tribes, is quite impossible to trace in detail.

Closely associated with the Kiowa were the Kiowa Apache (Mooney, 1898, pp. 245–253), who were supposedly with the Kiowa before they left their alleged early habitat in or near the northern Rockies. Their nearest linguistic relatives are the Jicarilla and Lipan (Swanton, 1952, p. 296). Kroeber (1939, pp. 37, 79) sees them as a band of eastern Apache—"mountain tribes, marginally Southwestern, fronting on the plains and hunting bison"—who, after they got the horse, "committed themselves definitely to the bison and the plains, and on account of numerical weakness joined themselves to the Kiowa." The first historical mention of them is thought to be as the Gattacka of La Salle in 1682. This term, similar to names by which the Kiowa Apache were known to the Pawnee, Omaha, and Ponca (Swanton, 1952, p. 296), appears on the Franquelin map of 1688 (Tucker, 1942, pl. 11A) just west of the Manruth (Kiowa?) in what is certainly the Southern Plains. Their earlier background and subsequent history in the 18th century, like that of the Kiowa, remain obscure. They certainly ranged widely, however, being reported by Tabeau at the Black Hills gathering about 1803. Harrington's suggestion (1940, p. 510) that the term Paloma Apache was perhaps the Spanish name for the Kiowa Apache is an intriguing one, and is, of course, in line with the previously cited view of Kroeber. It seems quite possible that both the Kiowa and the Kiowa Apache were rooted, at least in part, in the Padouca or Plains Apache who received so much attention from the Spanish in New Mexico during the 17th and 18th centuries.

## THE ARAPAHO AND CHEYENNE

The Algonquian-speaking Arapaho and Cheyenne were certainly late in the western Kansas region. The early history of both is obscure, that of the Arapaho especially so. Originally horticultural village peoples, both tribes entered the Plains from the western Minnesota region—first the Arapaho from the Red River valley, later the Cheyenne from somewhat farther south. The Arapaho drifted toward the southwest and eventually crossed the Missouri, after which time they are not known to have practiced corn-growing. The Cheyenne (Grinnell, 1923) dwelt for a time in southeastern North Dakota, where their 18th century archeological remains on the Sheyenne River have been identified (Strong, 1940, pp. 370–376). Continuing toward the west and southwest, they apparently retained agriculture for a while after crossing the Missouri. In Lewis and Clark's time, both tribes were located well to the west of the Missouri River—the Arapaho or "Ka-ne-na-vish" on the upper Platte in western Nebraska, the "Chayenne or Sharha" in the Black Hills district at the headwaters of the Cheyenne River (see Arrowsmith map of 1814, in Paullin, 1932, p. 29). Both are mentioned by Tabeau in this general region (Abel, 1939, pp. 154–155). During the 1830's and later came the gradual separation of both tribes into what came to be known as the northern and southern groups, the latter continuing to move south through the western Plains. Neither Arapaho nor Cheyenne were mentioned by Pike on his journey up the Arkansas in 1806, and his passing remarks suggest that this was still Comanche, rather than Arapaho and Cheyenne, range at that time. In 1820, however, when members of the Long expedition under Bell descended the Arkansas, they met a large band of Arapaho and Cheyenne, along with Kiowa and Kiowa Apache, near the point where Bent's Fort was erected in 1832; more of the same Indians were encountered as the detail marched downstream (James, 1823, vol. 2, pp. 174–198). In 1842 and again in 1843, Frémont reported Arapaho and Cheyenne on the South Platte near the mountains (Frémont, 1845, pp. 18, 23, 28–30, 111); and in 1844, some 20 miles below Bent's Fort on the Arkansas, he met "a very large village of Sioux and Cheyenne Indians, who, with the Arapahoes, were returning from the crossing of the Arkansas, where they had been to meet the Kioways and Comanche Indians. A few days previous they had massacred a party of 15 Delawares, whom they had discovered in a fort on the Smoky Hill river" (Frémont, 1845, p. 288). On Bvt. Maj. Gen. G. K. Warren's 1867 map of Nebraska, Dakota, and adjoining territory, a broad area running from the Colorado Rockies into the Plains between the Smoky Hill and Republican Rivers as far east as the lower Solomon in eastern Kansas is designated "Shyenne Indians"; to the south is indicated the Arapaho range. Both tribes, but especially the Cheyenne, figured in the Indian wars of this section prior to their placement on a reservation in the Indian Territory following the Medicine Lodge treaty of 1867. So far as I am aware, no sites attributable to the Southern Arapaho and Southern Cheyenne have been reported in western Kansas.

It should not be necessary to point out that the extensive territory assigned by Warren to the Cheyenne and Arapaho was by no means exclusively theirs. Other tribes, such as the Comanche, Kiowa, and Apache, also pursued the diminishing bison herds here (Beckwith, 1855); and as game elsewhere became scarcer and scarcer, still other tribes sent hunting parties into western Kansas. Among these were the reservation tribes from the eastern part of the State and perhaps occasional Oglala Sioux from the upper Platte valley in Nebraska. All fought bitterly and unceasingly against the Pawnee on their seasonal hunting excursions into the Republican-Smoky Hill-Arkansas plains. This, however, belongs to history, rather than to archeology, and is beyond the scope of the present paper.

## SUMMARY

The ethnohistorical materials just reviewed suggest that the two tribes with strongest claim to early and prolonged residence in what is now Kansas are the Wichita and the Kansa. The Wichita, or closely related peoples who may fairly be included under this name, evidently dominated the Arkansas River valley of central Kansas at the opening of the white contact period in the mid-16th century; and, although moving in general southward, they were probably present until some time in the early 18th century. The Kansa, first recorded in what appears to be the general Kansas region in 1673, were certainly residing in the State from 1723 until their removal to the Indian Territory in 1873. How much earlier these two tribes were in their early historic habitat is a problem for the archeologist rather than the historian. The Plains Apache, either as out-and-out bison hunters (Apache Vaquero) or as half-hearted horticulturists (Paloma, Cuartelejo, and/or related groups) held the western Plains, certainly from the opening of the 17th century—perhaps for some time before—until into the second quarter of the 18th century. It is possible, I suppose, that their residence in the region began about as early as that of the neighboring Wichita and Kansa. Of the Pawnee, only the Republican band can be documented as historic residents of a portion of Kansas; but they were late and only briefly here. If the other bands of this powerful and important Nebraska tribe resided in Kansas, there is no historic proof of that fact—or, as seems much more probable, their residence must be ascribed to an earlier, probably pre-Coronado, period, in which case they become an archeological problem. As to the other tribes whose names may be linked with the State as former residents, the Comanche, Arapaho, and Cheyenne were demonstrably late or transitory, or both. Essentially, the same holds for the Osage, for whom residence in the State can be documented only after circa 1815.

The historic distribution of these tribes, with their varying subsistence economies, conforms rather nicely to the several natural regions elsewhere outlined for the State. Absolute concordance need not be expected. Thus, the eastern portion, where normal precipitation averages around 32 inches or more annually and valley bottom horticulture is a reliable food source, was occupied or controlled by semihorticultural Siouan-speaking tribes—the Kansa in the glaciated northeastern corner, with the rolling unglaciated Osage Plains to the south as back country of the Osage whose villages stood mainly in extreme western Missouri. In the drier central third—the Plains Border of Fenneman—with annual rainfall averaging 25 to 30 inches, were semihorticultural Caddoan-speaking peoples—the Wichita south of the Smoky Hill drainage, the Pawnee in late villages on the Republican near the Kansas-Nebraska State line. Much of the north-central region was, of course, included in the regular seasonal hunting range of the Nebraska Pawnee. The western third, short-grass country too dry for dependable corn-growing, was Apache, then Comanche, finally Arapaho and Cheyenne—hunters all, though with some sporadic creek-valley corn-growing around the beginning of the 18th century among the Apache. This distribution of semihorticultural Siouans in the east, semihorticultural Caddoans in the middle, and basically nonagricultural Athapascan, Shoshonean, and other peoples in the west parallels the historic pattern of tribal distributions in Nebraska as outlined by Strong (1935, p. 40). When our archeological data have been presented, we shall have occasion to compare again these two areas with respect to the antecedents of the historic subsistence economies and the tribal or cultural entities involved.

## PREVIOUS ARCHEOLOGICAL WORK IN KANSAS

Observations and passing comments on archeological remains in what is now Kansas apparently began with the first American exploring expeditions through the region. As we have already noted elsewhere, Lewis and Clark, Long, and others on their way up the

Missouri regularly reported on two ancient villages of the Kansa; and Clark observed further that "this Town appears to have covd a large Space, the Nation must have been numerous at the time they lived here" (Thwaites, 1904–5, vol. 1, p. 67). None of these early observers, so far as I can determine, did any digging or collecting within the area of our interest.

Later, as the American frontier pushed westward and settlement of the trans-Missouri lands began, increasing numbers of persons saw and commented on the ancient remains along the stream valleys and adjacent bluffs of eastern Kansas. Since these antiquities were generally insignificant and unspectacular by comparison with the earthworks and other remains farther east, they attracted little notice and less discussion from either laymen or scholars. Thomas, for example, in his catalog of prehistoric works east of the Rocky Mountains, lists mounds reported in the literature from Coffey, Cowley, Leavenworth, Marion, Riley, Shawnee, and Wyandotte Counties (Thomas, 1891, pp. 88–89); but the State is not even mentioned in his later comprehensive report on mound explorations of the Bureau of Ethnology. The accompanying distribution map, however, indicates mounds on the lower Kansas, Republican, and Walnut Rivers and on the upper Cottonwood (Thomas, 1894, pl. 20). Similarly, Garrick Mallery's paper on picture writing devotes less than half a page to Kansas pictographs (Mallery, 1893, p. 80); and Holmes, a decade later, in his great study of pottery of the Eastern United States, makes no reference whatever to Kansas materials. As late as 1941, Shetrone (1941, p. 340) dismissed the mounds of Kansas in the following words: "A few scattering mounds have been noted in eastern Kansas, mainly along the Kansas River." Actually, as will become clear in the following pages, our long-standing ignorance of Kansas prehistory is due not to absence of aboriginal remains, but to the dearth of reliable information based on systematic research and excavation.

The earliest archeological excavations of which I find record pertain to mound investigations by the Reverend Isaac McCoy in the vicinity of Fort Leavenworth. McCoy was in charge of the boundary survey for the Delaware Indian reservation in 1830, in course of which he described Waconda Spring and various other features of interest in present northern Kansas. Apparently a good observer, he commented on the relative scarcity of Indian earthworks west of the Mississippi; and, intrigued by a group of eight mounds arranged in form of a cross about a mile west of Fort Leavenworth, he opened one on October 4, 1830 (Barnes, 1936 b, p. 360). He reported that the mounds were composed "of stones and earth, the former placed in a circle." Within the circle uncovered, were found fragmentary bones of adults and children which had been "under the action of fire. It appeared that after the bodies had been subjected to the action of fire, without being consumed entirely, they were covered with earth." McCoy conjectured that "human sacrifice had there been offered" (McCoy, 1840, p. 408). As will become apparent presently, McCoy's observations closely parallel, except in his final conjecture, those since made by others, including the writer, at other burial mounds in northeastern Kansas (p. 172).

Another mound in the same locality, possibly even in the same group, was explored a few years later by "three gentlemen from the garrison, with a view of removing a doubt as to their being natural or artificial." Again, only a few small fragments of bone were found. Lieutenant Carleton, reporting this work, observed that other hilltops in the vicinity also were crowned by mounds (Carleton, 1943, p. 163).

Kansas was admitted to statehood in 1861, and in the next two decades her population grew from slightly over 100,000 to nearly a million persons. Inevitably, the vestiges of earlier human occupations of the land came more and more to the notice of the white settlers, farmers, and others. By 1866, the State university and an agricultural college had been established, and scientists from these institutions were engaging in widespread investigations into the geology, natural history, and other resources of the State. The growing interest in these matters led to organization in 1868 of the Kansas Natural History Society which in 1871 became the Kansas Academy of Science. Scattered through the published reports of its early meetings are many notes that bear testimony to the abundance of archeological remains throughout the eastern half of Kansas. Both scientists and laymen shared in this early reporting; and while its quality varied a good deal, promising leads may still be found in some of the papers. Other notices appeared elsewhere in periodicals in and outside the State.

In a meeting of the American Philosophical Society in 1868, Miller discussed certain geologic features along the Union Pacific Railway in Kansas. He called attention to Indian and later petroglyphs carved in the soft sandstone of Inscription Rock, located 15 miles southeast of Fort Harker on Smoky Hill River (Miller, 1869, p. 383, pls. 7, 8). Some of the accompanying figures were subsequently included by Mallery (1893, fig. 44) in his monumental work on American Indian picture writing (see also p. 483).

In a paper read before the sixth annual meeting of the Kansas Academy of Science in 1873, Mudge reported three localities where he had seen potsherds and other refuse of former Indian occupancy (Mudge, 1896). One of these was about half a mile north of the Santa Fe Trail crossing of Cow Creek, in Rice County (see p. 323);

another was near a fine spring in the extreme northeast corner of Riley County; and the third was near Asher Creek and Solomon River, in Cloud County. Of particular interest is the last location, regarded by Mudge as most promising of the three. Here he reported much clay "mixed with straw," as well as "fragments of what appeared to be the ovens in which the pottery had been baked." I am inclined to suspect that what Mudge actually saw here was grass-impressed wattling clay or daub, probably from the covering of burned earth lodges. Whether any of the sherds, grass-impressed clay, or other objects from the site were saved and, if so, their present whereabouts, remains unstated.

Five years later, in another paper read to the Academy at its eleventh meeting, Adams described the results of recent digging by himself and others in mounds near Fort Leavenworth (Adams, 1906). This work was evidently in mounds near those reported by McCoy (1840, p. 408) and Carleton (1943, p. 163), perhaps even in the same group. Adams' findings were, in the main, confirmatory of the earlier observations, except that he suggested the former presence of vaultlike dry-masonry structures within the mound.

For the next decade there are several records of mound observations. In 1879 Curtiss investigated a burial mound and several rock cairns in the vicinity of Marion, and a collection of bone, stone, and other objects resulting from this work was deposited in the Peabody Museum (Putnam, 1880, pp. 718, 738). Further information on antiquities of this interesting locality was published a few years later by Billings, a local collector in Marion. He reported several mound groups, suggested that some of the mounds were house ruins, and described deep ash beds which suggest cache pits. No artifacts are described; but Billings suggested that the relics found fell into three classes: Mound Builders, Cremators, and Modern Indians (Billings, 1883).

At about the same time, Robinson (1881, p. 446) reported many stone heaps and other antiquities, including pottery, on Wolf Creek, a tributary of the Neosho near Burlington, in Coffey County; Stockton (1883, p. 685) reported a cave with carvings on its walls near Toronto, in Woodson County, but said there were no mounds in the vicinity; and Serviss (1883, p. 528) stated that there were "on the farm of J. L. Stockton, 1 mile northwest of [Wyandotte City, now Kansas City, Kans.], remains of an aboriginal workshop or village . . . located on a small stream called Jersey Creek, and near a large spring. It covers about 2 acres. . . . The fragments of pottery are the most numerous . . . composed of a mixture of clay, sand, and pounded shells. The variety of the combinations of lines and dots is inexhaustible . . ." He reported also several mounds near Edwardsville, subsequently excavated by Brown for the University of Kansas (see Wedel, 1943, p. 102). Parker (1887, p. 72) reported briefly on burial mounds on the Republican River bluffs 3½ miles northwest of Junction City, where fire-blackened bones and stones, along with pottery, beads, and other artifacts, were found.

In contrast to the cursory notes and observations cited above was the work carried out by Udden in 1881–88, at the Paint Creek village site south of Smoky Hill River, a few miles southwest of Lindsborg, McPherson County. An instructor at Bethany College at the time, and later a geologist of considerable standing, Udden devoted his leisure time during some 7 years to explorations here. Like those who have since investigated this site, Udden found an abundance of pottery and a variety of stone and bone artifacts, all of which he described and interpreted with commendable clarity and fullness. He surmised that the former inhabitants had been semihorticultural, and suggested possible relationships to the Wichita or Pawnee. Discovery of a fragment of chain mail in one mound and of two glass beads on another persuaded him that the site had been visited by the Spaniards, perhaps even by members of the Coronado expedition. The conclusions tentatively reached by Udden in his clear objective presentation (Udden, 1900) parallel in gratifying fashion those since reached by others (see, e. g., Wedel, 1935) with a far richer background for comparative purposes and interpretations. Basically, his report stands as one of the few bright spots in Kansas archeology to date. Despite Udden's disclaimer to the designation of archeologist, one wonders whether archeology was not the loser when his later career led him into full-time geologic studies.

The next decade, 1890–99, saw additional records of archeological observations in various parts of the State, including some that have had lasting value. In 1890 Mead reported on antiquities about the confluence of the Arkansas and Little Arkansas Rivers, on the present site of Wichita, in Sedgwick County, where he operated an Indian trading post among the Wichita in 1864 (p. 68). He noted that plowing turned up many objects of an earlier day, especially large numbers of small, triangular, unnotched arrowpoints. Other pottery-bearing village sites occurred on Chisholm Creek, 2 miles south of Wichita, and on the west bank of the Arkansas 4 miles south of the city. Caving of the banks of the Little Arkansas exposed a pottery vessel, undescribed, at a depth of 6 feet. Mead saw no obsidian and no painted or glazed pottery, hence no evidence of southwestern relationships or contacts (Mead, 1890). Four years later, Newlon (1894, pp. 192–193) noted that there were many mounds along Shoal Creek, tributary of Spring River near Galena, as well as village sites along the Ozark foothills nearby. To him, the remains suggested two peoples or epochs.

In 1896–97 Gould investigated the Timbered Mounds on the Kaw Reservation just south of the Kansas State line. Here he at first saw "rude edifices" with "faint outlines of structures;" but Williston convinced him that these were actually Indian chert quarries. The old workings were scattered in two localities on both sides of the State line. Gould observed that the fusulinid chert occurring here in nodular form also occurred as artifacts in ancient Indian mounds 20 miles to the northwest, near Arkansas City, Kans. (Gould, 1898 a, 1899). My own observations on these old workings are reported elsewhere in this paper (p. 476). As regards the Arkansas City mounds, there are brief accounts from this same period in several places (Johnson, 1897; Gould 1898 b). All tell briefly of investigations on the Beavers farm 2 miles east of the city, where mound explorations yielded a variety of pottery, stone, and bone remains, as well as features that cannot be certainly identified at this time. Of especial interest is one of the several pots found; according to Johnson (1897, p. 96), it was "highly decorated and colored, and a very superior piece of work. The decoration consists of three parallel lines, one of blue and two of red, running around the pottery at the top. The rest of the piece is light yellow and the material composing it is light and fine." Assuming that this was an honest attempt, by one with limited archeological experience, to describe what he saw, I think it can safely be said that the vessel was not of local Indian manufacture; but was it, perhaps, a late puebloan piece from the upper Rio Grande? The site is without much question that I have since termed the Arkansas City Country Club site, in which I made limited excavations in 1940 and where puebloan glaze-paint sherds were found. Unfortunately, I do not know the present whereabouts of the vessels described by Johnson, and so am unable to check his observations. Elsewhere (p. 351), the results of my investigations on the site are presented in detail.

To this period, beginning about 1895, belong the investigations of J. V. Brower in the lower Kansas River drainage. Working with farmers, local collectors, and other enthusiasts, Brower acquired a very large collection of archeological materials that was subsequently carried to Minnesota. He concluded that two cultures were represented: the Quiviran remains, characterized largely by crude stone tools and absence of pottery, and occurring mainly south of Kansas River from Geary County westward; and the Harahey culture to the east and north, wherein pottery, stone, bone, and other materials, sometimes evidently associated with semipermanent house remains, were characteristic. For the most part, Brower's inferences were derived from surface materials and from the results of uncontrolled digging by his local supporters, generally no better trained in scientific methods than he was. It now seems possible that some of his "Quiviran" specimens were actually workshop and quarry materials—blanks, rejects, etc.—for which definite dating or cultural attribution are not yet possible. Others, however, suggest an early, possibly preceramic, lithic industry. Among the objects Brower described or figured as Harahey are included those of several distinct cultures; some belong to complexes with rectangular earth lodges and evident "Upper Republican" affiliations while others appear to have Woodland, Hopewellian, or other connections. I believe that most of Brower's conclusions are either wholly untenable or else are still subject to verification or correction. However, anyone undertaking archeological work in the area covered by him can ill afford to neglect altogether his published reports, for they contain many provocative and often profitable leads. There are two of these reports (Brower, 1898, 1899), published as volumes 1 and 2 of his series of memoirs of explorations in the basin of the Mississippi.

Another interesting development of this period was Martin's discovery in 1895 of a chipped blade or point in direct association with the bones of a large fossil bison. The locality was about half a mile north of Smoky Hill River, on Twelve Mile Creek, some 12 miles east of Russell Springs, in Logan County. The bones were in a bed of "fine silty material, blue-gray in color. Overlying this were twenty feet of the so-called plains marl . . . The bone bed, when cleared off, was about ten feet square, and contained the skeletons of five or six adult animals, and two or three younger ones, together with a foetal skeleton within the pelvis of one of the adult skeletons. The animals had evidently all perished together in winter" (Williston, 1905 a, p. 336). In another account, Martin gives the vertical depth of the artifact, which lay beneath and in contact with the right scapula of the largest animal, as 25 feet (McClung, 1908, p. 250). Williston's initial identification of the bones as *Bison antiquus* Leidy was later changed by Lucas to *Bison occidentalis* (Williston, 1905 a, p. 335), which Skinner and Kaisen (1947, p. 171) regard as "a later animal on the plains of North America than *antiquus*, but [which] was the successful surviving species that gave rise to the recent plains bison." So far as I know, the circumstances of this find have never been questioned, and the association is apparently accepted by paleontologists qualified to judge the merits of the case (Sellards, 1940, p. 387); but as in many other comparable occurrences, the possibility of postglacial survival of the species involved has been raised (Romer, 1933, p. 79). According to Schultz and Eiseley (1935, p. 312), "In the case of Williston's find this assumption of a sub-Recent dating is certainly open to question, the site having been reputably diagnosed as Pleistocene and containing, besides *Bison occidentalis*, *Elephas columbi* and

*Platygonus compressus.*" With reference to the latter two species, Williston's report on Martin's find reads as follows: "The material covering the [bison] skeleton is the characteristic plains marl, in which and not far distant from the site of the arrowhead I have obtained bones of *Elephas primigenius* and *Platygonus compressus*, both characteristic pleistocene mammals of the so-called Equus Beds, or Sheridan Stage" (Williston, 1905 a, p. 337). Here, as elsewhere in America at that time, I suppose there would have been no question about the Pleistocene dating of the site had there not been evidence of human associations.

The point itself has since been lost, though there are photographs of it. From the illustrations by Williston (1905 a, p. 336), it appears to have had a relatively short broad outline, with convex edges and slightly concave base; there are no shoulders nor is there definite fluting of the faces. There is nothing outstanding in the chipping and workmanship. It does not conform closely to any of the recognized early Plains types, such as Folsom fluted, Clovis, San Jon, Eden, Scottsbluff, Plainview, etc., although Howard (1935, p. 144) thought it resembled "a rather crude type of Folsom-like point . . ."; nor is there any specific resemblance to points reported from Nebraska in association with *Bison occidentalis* (Barbour and Schultz, 1932, fig. 165). Curiously enough, the find is not mentioned in some of the more recent surveys by archeologists (see, e. g., Roberts, 1940; Wormington, 1957) of the Early Man problem in the New World; but Sellards (1940, p. 387) devotes a page to a good summary, and in another place (1952, p. 47) terms it the "first discovery in America of an artifact known to have been used by early man in hunting bison of a species now extinct."

Before the close of the century, Williston and Martin made another noteworthy contribution to Kansas archeology. In 1898, they excavated a seven-room pueblo ruin in the Beaver Creek valley, about 10 miles due north of Scott City, and several good papers reported their findings here (Williston, 1899; Williston and Martin, 1900; Martin, 1909; see also Hodge, 1900). The excavations yielded considerable quantities of maize, as well as metates, pottery, incised clay pipes of late puebloan style, bird-bone flageolets, an iron axhead, and a variety of objects of chipped and ground stone and of bone. The remains of a fireplace and chimney were found where they had been built into the wall of one room; in another was a typical pueblo grinding trough; and nearby irrigation ditches were reported to follow the lines of earlier ditches found by the first white settlers in the valley. Williston's first conjecture was that the ruin marked the site of an early Spanish establishment; but Hodge correctly noted that the architecture and other features were typically puebloan, and suggested that the ruin was that of the fortified spot known as Cuartelejo, to which late 17th and early 18th century Pueblo Indians fled from the upper Rio Grande (see p. 23). In 1925 a granite shaft was erected at the spot by the Kansas Society of the Daughters of the American Revolution, with the following inscription: "This marks the site of the Picurie Indian pueblo 1604 [sic] which became an outpost of Spanish civilization and a rendezvous for French traders prior to 1720." The results of my own investigations here for the National Museum in 1939, which were concerned chiefly with refuse deposits near the old foundation and exploration of various lesser features nearby, are detailed elsewhere in the present paper (p. 424).

Shortly after the turn of the century came another find which attracted attention far beyond the borders of the State since it apparently bore on the then lively question of glacial man in America. This was the accidental discovery in February 1902 of skeletal parts of two humans beneath 20 feet of undisturbed soil on the Concannon farm near Lansing. The site was a small bench overlooking the Missouri River bottoms, just inside the bluff line at the mouth of a deep ravine. Soon after the discovery, the site was examined by a number of distinguished geologists and anthropologists; and in a search for further relevant geologic data, Fowke under auspices of the Bureau of American Ethnology, made additional excavations nearby. Before the end of the year, no less than six geologists had published their views on the find (Sellards, 1940, p. 386). Apparently, no one questioned, then or later, the occurrence of the bones as reported by the finders; according to Fowke (Hodge, 1907–10, pt. 1, p. 759), they "denoted an intentional burial."

Williston, who first announced the discovery (Williston, 1902 b, 1905 b), denied that the bones were of glacial age, as claimed in some contemporary newspaper accounts. In his view, the materials overlying the bones were certainly river-deposited, not aeolian, and thus dated from a time when the Missouri River flowed at a much higher level than at present. He held that the bones were indeed old, representing people who were contemporaries of the mammoth, mastodon, extinct bison, camel, and other ancient forms. Upham, Winchell, and Haworth were also among those who believed the bones were very old, the first two indeed arguing vigorously for their contemporaneity with the Iowan stage of glaciation (see Chamberlin, 1902, p. 745, and Winchell, 1903).

Opposed to belief in such great antiquity were Chamberlin, Salisbury, Calvin, Holmes, and Fowke. In a detailed discussion of the geology of the site, Chamberlin (1902) contended that the fill consisted of "lodgment deposits derived from the upper slopes" of the nearby bluffs, and of "silts blown up from the Missouri bottoms. . . . The antiquity of the burial is measured by the time occupied by the Missouri River in lowering its bottoms, two miles more or less in width, somewhere from 15 to 25 feet, a very respectable antiquity, but much short of the close of the glacial invasion." Calvin and Salisbury endorsed this position (Chamberlin, 1902, pp. 777–779), and Todd (in Winchell, 1903, p. 293) also seemed inclined to accept it in preference to Winchell's stand. Holmes (1902, p. 751) summarized this view as follows:

> The preferred interpretation of the phenomena, then, is that the relic-bearing deposits of the Concannon bench were not laid down in glacial times by the silt-charged waters of the Missouri, but that they are a remnant of delta-like accumulations formed in comparatively recent times within and about the mouth of the tributary valley by local sub-aerial agencies, all save the more protected portions having been removed by late encroachments of the ever-changing river.

The bones represent an adult male and a child of 6 or 7 years. The adult skull was repaired and first examined by Dorsey (in Holmes, 1902, pp. 744–745), who noted that "in its general shape the skull bears a striking resemblance to the crania of the Plains Indians, for example, the Blackfoot."[11] All the bones, it appears, subsequently underwent a careful scrutiny by Hrdlička. He concluded (Hrdlička, 1907, p. 52) that "the Lansing skeleton is practically identical with the typical male skeleton of a large majority of the present Indians of the Middle and Eastern States." In support of this statement, he sought to show in a tabular summary that there were no significant differences between the Lansing skull and a selected series of recent crania from the same general region—including Ponca, Kansa, and two Pawnee—in the National collections. However, comparison of the given measurements and indices with similar items in the catalog of Siouan, Caddoan, and other crania published 20 years later (Hrdlička, 1907, p. 52; cf. 1927, pp. 66, 80), raises some puzzling questions. The two Pawnee skulls in the 1907 comparative table, for example, are longer and higher than any of the three listed in the 1927 catalog; and the cephalic index given for the first two—74.3—compares with indices of 80, 81.5, and 82.9 in the catalog. The Ponca skull ("796, National Museum") of the comparative table is clearly No. 225285 of the catalog, in which it has the second lowest cephalic index of 11 male Ponca averaging 79.3. For the Lansing skull, Hrdlička gives a cephalic index of 73.5. I find no "Kaw" (Kansa) crania in the catalog. It is difficult to resist the suspicion that Hrdlička's comparative table is slanted toward a desired end, that is, to prove a point—the lateness of the Lansing skull; if not, the apparent errors and discrepancies remain to be explained away. In any case, I am unconvinced that Hrdlička proved his point with the examples he used.[12]

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[11] Hrdlička's catalog of human crania (1927, p. 92) includes no male Blackfeet. For a series of 11 male Piegan, close relatives of the Blackfeet, the averages in the catalog,

In actuality, the Lansing skull resembles less the recent groups selected by Hrdlička than it does certain prehistoric crania from burial mounds along this stretch of the Missouri. For example, there appear to be close similarities to the Kansas City vault mound (Hopewellian) series described by Stewart (1943, pp. 261–265, and table 13), who noted further that the Lansing skull is higher headed than the average Siouan or Caddoan skull. Precise classification or typing of the specimen is, of course, a problem for the physical anthropologist, who today has much more comparative material at his disposal than Hrdlička had. Meanwhile, it seems to me that the Lansing skull is in much more congenial company among such older, generally long-headed, types as are found with Hopewellian, early Woodland, or perhaps Archaic horizons than among the Siouan, Caddoan, or other recent tribes of the eastern Plains.

It is interesting to note that the lively controversy briefly touched on here revolved mainly about two points: (1) the glacial or postglacial age of the deposits, and (2) the similarity or dissimilarity of the bones to those of modern or late Indians of the region. On both scores the preponderance of professional opinion was, and presumably still is, against great antiquity for the Lansing remains. Needless to say, the depth of overburden is of itself not necessarily indicative of great age, and unfortunately there is still no reliable method of dating accurately the length of time involved in the deposition of such a blanket. Still, I find it difficult to believe that an undisturbed deposit that some competent geologists, like Williston, sincerely regarded as

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insofar as they are directly comparable to the table Hrdlička (1907, p. 52) uses to show Lansing Man's physical relationships, bear out Dorsey's observation as quoted. The cephalic index of the Piegan skulls ranges from 73.1 to 78.8, and averages 75.8 as against 73.5 for the Lansing skull.

[12] On January 21, 1954, with M. T. Newman, associate curator of physical anthropology, U. S. National Museum, I reexamined the four skulls used by Hrdlička in the above comparison. Although we checked none of the measurements, partial answers to certain of the puzzling questions now suggest themselves. All four specimens have been renumbered since the report on the Lansing remains. The two Pawnee skulls are numbered 225291 (old number 550) and 225292 (old number 531). Inside the first, now sexed as a female, we found a note clearly in Hrdlička's handwriting, which said "Not Pawnee (mixed with whites—or a white?)." The second also contained a handwritten note, initialed "A. H.," and reading as follows: "This is not a Pawnee (mixed with white? or Algonquian?)." The "Kaw" skull, No. 152 of the comparative table, has the permanent number 225290; on the skull, in ink, the identification is doubly questioned, thus "Kaw??". Thus, three of Hrdlička's examples turn out to be of doubtful ancestry or tribal affiliation; the fourth, as already noted, is near the end of a group range and not an average. I suppose there is no way of determining when Hrdlička revised his identifications; perhaps the nature of the revisions had something to do with the omission of these particular specimens from the final catalog. In any event, the dubious nature of the evidence in this case seems clear; the reader may judge for himself the validity of any conclusions based thereon by Hrdlička.

early postglacial could be as young as the anthropologists strove to make it appear. Hrdlička's selection of skulls from tribes who almost certainly entered the region in the past five to eight centuries, and Holmes' remark that "the time required by the river to lower its bed five or ten feet might possibly be expressed in hundreds rather than in thousands of years" (Holmes, 1902, p. 751), doubtless reflect the widespread opposition among professional anthropologists of the period to the idea of ancient man in America. Chamberlin, who had no such ax to grind, was apparently willing to concede a considerably greater age—"a very respectable antiquity"—to the deposits; and this would seem to fit better the modern views as to similarity of the Lansing skull to prehistoric physical types of the lower Missouri Valley two or three thousand years, or more, ago. If Lansing Man was not glacial or early postglacial, neither was he recent Siouan or Caddoan; and the possibility of a respectable antiquity seems very good. He may well represent one of the earlier ceramic or late preceramic peoples of the region. Should the time ever come when a comprehensive program of integrated archeological and geological investigation can be carried out on the buried creek-valley and terrace sites along the borders of the Missouri River trench, with particular reference to prehistoric man, I believe the Lansing locality will have to be further considered along with such sites as Sterns Creek, in Nebraska, and with others still unreported and undescribed.

In the decade following Lansing Man's discovery, there seem to have been no systematic excavations or otherwise outstanding developments in Kansas archeology. Brief notices of local digging or of casual observations continued to appear, however, especially in the pages of the Archeological Bulletin. This little journal, quarterly publication of the International Society of Archeologists, ran to nine volumes between the years 1909 and 1918. For a time it was published in Council Grove, and some of its most active supporters and contributors were residents of Kansas. And, as before, other notes continued to appear in the transactions of the Kansas Academy of Science, with occasional short papers published by the State historical society.

In 1904, Richey reported that the historical society had received Indian relics from the Kansas, Republican, Smoky Hill, Verdigris, and Marais des Cygnes Rivers, and commented on recent findings at the Paint Creek site near Lindsborg and on Gypsum, Holland, and Turkey Creeks nearby to the east. Of greater interest are his observations on—

> a very interesting village site and fort on the Verdigris river . . . three miles north of Neodesha, near to and east of the river. The lodge sites occupy a considerable area, and the village seems to have been an important one . . . Shells, stone mauls, flint arrow-points, hammers, rubbing stones, scrapers, pitted stones,

> flint chips, and other objects were found on the site . . . The form of this fort is almost that of a horseshoe, with the opening toward the east . . . A piece of the butt plate of a gun and an old iron ax beveled only on one side were unearthed near the fort; also bullets and trinkets probably traded to the Indians by white traders, were found.

These articles, of both Indian and white origin, were said to have been placed on display at the society's museum (Richey, 1904, pp. 135–136). In the same publication, Griffing described briefly findings by himself at village sites and in mounds on Wildcat Creek, and on the Republican and Kansas Rivers, further noting that "I have either opened or assisted in opening more than 100 of these burial mounds" (Griffing, 1904, p. 134). In 1905, Mead wrote about remains on Whitewater River near Augusta, including "a former soil surface two feet thick" beneath 8 feet of clay or loess; "on the surface of the black soil and under the 8 feet of clay, I found the remains of a camp, containing broken pottery, charcoal, ashes, burnt bone, and stones. . ." (Mead, 1905). There are also terse notices of antiquities along Diamond Creek, in Morris County, by Morehouse (1910); of ancient house pits on the Missouri River bluffs and of pottery sites along Wolf River, in Doniphan County, by Plank (1910); and of a refuse-littered occupation area with "at least 20 tipi sites" on a hill near Sparks, by Dinsmore (1912; see p. 132).

Among all these amateurs, the name which appears most often is that of George J. Remsburg. He contributed frequently, if usually briefly, to the pages of the Archeological Bulletin concerning antiquities in northeastern Kansas, chiefly in Atchison, Leavenworth, Pottawatomie, and Riley Counties (Remsburg, 1893, 1894, 1909, 1910, 1911, 1912 a, 1912 b, 1915 a, 1915 b). These included village sites, historic and other burials, and mounds, some of which seem to have been chambered. He also reported (Remsburg, 1912 b, p. 122) rock carvings of which he was informed in Labette and Woodson Counties. Probably his most important contribution was the identification of remains at Doniphan with the Kansa village visited by Bourgmond in 1724, and the assembling of all data he could get from early residents regarding the features of the old Indian townsite (Remsburg, 1919; see also p. 101). He claimed also (1911, p. 67) to have located the site of the second and later old Kansa town farther downstream, just north of Fort Leavenworth; but I have not been able to verify this, and the only remains I had opportunity to examine in this locality were of much earlier, presumably Hopewellian, affiliation (Wedel, 1943, p. 102). Probably the numerous short statements published by Remsburg contain leads that would still repay follow-up work.

In 1913, the presence of glacial man in the Kansas plains was proposed again, this time by a Minnesota geologist and one-time president of the Geological Society of America. Winchell, one of the chief protagonists of glacial antiquity for the Lansing Man, had by this time carefully reexamined Brower's extensive chipped-stone collections from the Kansas River valley; and, stimulated by correspondence between Brower and Thomas Wilson, curator of prehistoric archeology in the National Museum, he set out to demonstrate that the "coarsely chipped large artifacts which Mr. Brower attributed to the Quivirans (Wichita Caddo)" were in reality "distinctly paleolithic and manifest all the characteristic features of the paleolithic artifacts of Europe." Nearly all were patinated in one way or another, he claimed, and many had been rechipped by later peoples. He inferred that there had been two stages, plus several substages, of ancient culture near the Kansan chert beds: the oldest, a paleolithic complex, which antedated the Kansas glaciation, and a later neolithic stage, or stages, occupying post-Kansan time. Lansing Man, he insisted, was from the Iowan glaciation, and "probably took part in the making of some of the Early Neolithic implements found on the Kansas upland interior." All of this seems somewhat farfetched today; and the chief merit of Winchell's book (Winchell, 1913) is perhaps in its halftone illustrations of the roughly fashioned cores, quarry blanks, blades, and other chert artifacts that once occurred in such extraordinary abundance along the belt where the Kansas River traverses the Flint Hills upland. As a sign of the times, Winchell's preface censured "the powerful influences that are localized in Washington" for denying glacial man and paleolithic implements in America. In a reply that Winchell probably never saw, one of those "powerful influences," who shall be nameless here, wrote on the fly leaf of his book, "This work is the best illustration of utter error and silly foolishness ever issued from the press."

The next two decades, roughly from 1912 to 1932, were essentially a continuation of the preceding ones, with sporadic observations, little systematic fieldwork, and no comprehensive publications. Early in this period, from 1912 to 1914, F. H. Sterns was engaged in an intensive archeological survey of the Missouri River bluffs zone in eastern Nebraska for the Peabody Museum of Archeology and Ethnology, and this work was carried southward into the two Kansas counties of Doniphan and Atchison.[13] Sterns established the existence of the Rectangular Earth Lodge culture, since designated the Nebraska Culture, in Northeastern Kansas. He also noted a large mound near Iowa Point, which had been extensively looted by relic hunters; and 3 miles south of White Cloud, on Cedar Creek, he reported that rains had washed out pottery bearing wickerwork and cord impressions, and with punched rim bosses. He made a few observations on a late site on Wolf Creek, presumably that described elsewhere in the present paper as the Fanning site (see p. 131), noting that the pottery here was shell tempered, without cord markings, and resembled that from a large campsite, now known as the Leary site, on the lower Nemaha River (see Hill and Wedel, 1936). For the Wolf Creek site he suggested a Kansa origin.

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[13] This study remains in manuscript, and only one of the two short published papers based on it makes brief mention of Kansas findings (Sterns, 1914). My remarks here are based on notes made by Dr. W. D. Strong, who has discussed Sterns' materials at some length and has related them to later findings in Nebraska archeology (see Strong, 1935, pp. 49, 250–266); and on a brief examination of the Sterns' collections from northeastern Kansas, now in Peabody Museum, Harvard.

At about the same time, Gerard Fowke briefly surveyed this portion of the Missouri Valley, from Doniphan County, Kans., to the vicinity of Omaha, but apparently without doing any excavating (Fowke, 1922, pp. 151–154). The Taylor mound, near White Cloud, Kans., which he was told was the largest mound in the State and from which local collectors had taken 50 or more skeletons, is evidently the same mound Sterns reported. From my own observations here in 1937, I believe that a good deal of information is still to be gotten from this structure, since the mound appears to be at least 5 or 6 feet deep and 30 yards or more in diameter, and most of it was said to be still untouched by local digging. Near this mound, Fowke reported a very large house pit, still visible in 1937; others occur nearby in some numbers. Near Iowa Point, Fowke reported a mound, or mounds, with slab-cist and stone-vault(?) burials. He also mentions the Leary site on the Nemaha, erroneously ascribing it to the Pawnee, who were supposedly dealt a crushing defeat here in 1837 by the Iowa and Oto (cf. Hill and Wedel, 1936, p. 66); and he could see no difference between the remains here and those found in the house pits nearby, "unless it may exist in the markings in the pottery . . ." Fowke seems to have shown less insight and exercised a good deal less restraint than Sterns in his evaluations of the archeological potentialities of the region and of the significance of the materials he saw. He concluded this section of his report on the following note: "Any estimate of age must be only a guess at the best, but it is a safe guess that no earthwork, mound, lodge site, or human bone along this part of the Missouri River has been here as long as 10 centuries."

To what extent Sterns and Fowke were aided and perhaps influenced by local persons in their northeast Kansas observations is not clear; but it may be presumed that both were in contact with Mark E. Zimmerman of White Cloud, self-styled State archeologist of Kansas, and his assistant, Ed Park. These two men, with no professional training and possessing more enthusiasm than sense of scientific problem, did considerable collecting and some digging in northeastern Kansas and in adjacent districts. Zimmerman's reports contain some useful data on village sites and other local antiquities, but are beclouded with long discourses on various esoteric matters and strange theories; they contain, in short, a great deal more chaff than grain (see, e. g., Zimmerman, 1918). Yet, as we shall see presently (p. 620), these observers had arrived at a local scheme of culture sequence which is substantially in line with present archeological views.

Elsewhere in the State, Allison and Randolph about this time published a short paper on antiquities in the vicinity of Pittsburg. These included chiefly chipped stone, with only passing mention of pottery. They also proposed a local sequence going back to perhaps 12000 B. C., and involving certain climatic variations (Allison and Randolph, 1927). Farther west, Paul Jones, newspaper editor of Lyons, issued the first of several books calling attention to abundant archeological remains in Rice and nearby counties, and maintaining with very good reason that these marked the location of the Quiviran settlements seen by Coronado (Jones, 1929, 1937; cf. Wedel, 1942, and Bolton, 1949, pp. 284–304). These remains were also the subject of a paper by Thoburn (1927), and were briefly mentioned by Moorehead (1931, pp. 85–88) in his survey of archeological materials in the Arkansas River valley. Moorehead's survey was a rather superficial one; it recorded a number of village and burial sites reported by local collectors in Butler County and elsewhere in and near the Arkansas drainage, but there are disappointingly few and vague details regarding the nature of the remains. He also reported at some length on observations by Thoburn at "an ancient irrigation canal" in Clark County, near which were seen "two low earthen mounds, at points on its course, which were certainly the ruins of such [puebloan] structures" (Moorehead, 1931, pp. 90–91). There has been, to date, no subsequent confirmation of these puebloan ruins or of an "ancient" irrigation system in the locality.

Mention must also be made of the work of certain nonprofessionals, which promises to contribute materially to our understanding of certain aspects of Kansas prehistory. One of these was Floyd Schultz, formerly of Clay Center, whose excavations and surveys in the lower Republican River valley resulted in a large cataloged collection which, with accompanying records, is now in possession of the University of Kansas Museum of Natural History. Publication of this material should clarify our knowledge of "Upper Republican" and earlier complexes in the Kansas-Nebraska region. Similarly, the carefully done commercially oriented excavations of G. L. Whiteford at a village and burial ground near Salina open interesting vistas on relationships between the prehistoric rectangular earth-lodge peoples of east-central Kansas and the more advanced cultures of the lower Arkansas valley region (see also p. 512).

For present purposes, our survey of archeological work in Kansas prior to the investigations comprising the body of the present paper is substantially complete. We need mention only the further fact that in 1934 an expedition from the Nebraska State Historical Society opened three earth-lodge ruins at a village site on the Solomon River 3 miles south of Minneapolis, and made brief tests at other sites near Glen Elder and at Udden's Paint Creek site near Lindsborg (Wedel, 1935). The writer's investigations for the United States National Museum were initiated in 1937 and continued until 1940; the findings are detailed in the pages which follow. The results of more recent investigations and studies by professional anthropologists at the University of Kansas and by Missouri River Basin Surveys personnel will be considered in the relevant sections of this report. It is gratifying to record in closing, however, that, with the exception of a few years between 1942 and 1946, the State university has included a professional anthropologist on its staff since 1937. Thus, there is available today within the State competent professional advice and assistance to those local persons and others interested in the archeology of Kansas.

## ARCHEOLOGICAL INVESTIGATIONS IN NORTHEASTERN KANSAS

### THE DONIPHAN SITE (14DP2)

Our investigations in northeastern Kansas began with a brief examination of a site on the Missouri River bluffs at the village of Doniphan. The locality, an attractive and historic one, centers in a little valley surrounded on the east, north, and west by prominent hills. Doniphan itself, with less than 200 inhabitants, retains little trace of its own picturesque past. First settled as a trading post in 1853, it soon became, on removal of the Indians, an important shipping point for grain, produce, and other commodities. With establishment of a United States land office in 1857 came a short-lived boom that saw single lots selling as high as $2,000; the townsite was surveyed, streets graded, and much residential and commercial construction undertaken. A year or two later, when the land office was transferred elsewhere, began a steady decline, temporarily arrested by the development of a flourishing grape-growing and wine industry in the 1870's. At its peak, the town boasted two railroads, grain elevators, flour and sawmills, two packing houses, a newspaper, general stores, saloons, agencies, offices, several hotels, and three churches; and in 1857, as again in 1871, its population was estimated at upward of 1,000. In 1859, Abraham Lincoln delivered a campaign speech in the town. As many as four and five landings daily were made by steamboats, and the river warehouses did a rushing business in furniture, tools, farming implements, and other items.

Today the railroads are gone, and the river channel is a mile or more distant from the old landing. Most of the business houses, stores, residences, and other establishments have been burned down or removed, and the erstwhile commercial and industrial interests have long since shifted to Atchison, a few miles downriver. Gone, too, are the splendid Belleview and other vineyards that once covered the adjacent hills, though fallen-in wine cellars still remind one of the industry that once produced thousands of gallons of beverage yearly. A store or two, a school, a church, and modest dwellings widely scattered along the old streets and over the valley slopes are Doniphan today.

The valley in which Doniphan lies, nowhere much exceeding half a mile in width, is drained by a small unnamed creek rising a mile or two north of the town and flowing due south to empty into the Missouri River bottoms near the old steamboat landing. Virtually dry during our 1937 dig, the creek was a running stream in the 1860's and 1870's, and is said to have occasional remnants of once-perennial springs at several points along its short course. It is now deeply entrenched, so that the gently sloping valley bottoms consist of pleasant terraces, beyond which the ground rises on the east and west to ridges 120 feet or more in height. These ridges terminate in steep south-facing bluffs, against the base of which the Missouri flowed before 1900. The river bottoms are partly under cultivation, but more of their area is overgrown with cottonwoods, willow, cattail, and the like. A fluctuating body of water known as Lake Doniphan marks the old course of the river. The terrain east and north of Doniphan is rough and hilly; to the west, the valleys of Independence Creek and its tributary, Rock Creek, lie just over the first ridge, beyond which the hills and ravines continue. Limited stands of hardwood forest fringe the streams and cover the steeper slopes of the bluffs, but most of the land is in cultivation (pl. 1, *a*).

Although the former existence of a large and important Indian village on this spot has long been known, its precise location and extent seem never to have been set forth adequately by those who recognized it in the early days. Our investigations disclosed relatively little archeological material on the west side of the creek, and despite repeated inquiries, we were not able to learn of the discovery of ash beds, graves, cache pits, lodge sites, or other prewhite evidences of occupancy on the valley bottoms. On the rising ground east of the creek, however, above the point to which Doniphan seems to have spread and just out of sight of the river valley, we found a group of 15 cache pits scattered among the trees of a hillside orchard. On the winding ridge a hundred yards or more to the east two pithouse ruins were found;

and beyond these, on a spur running toward the river, were several small burial plots. All this suggests that the main area of Indian occupancy lay somewhat to the east of the Doniphan townsite, or else that the tangible evidences of that occupancy farther downhill have been completely obliterated by the present community. The latter alternative seems rather more probable, since the lower slopes and terraces of the creek valley would hardly have been passed over by Indians in search of convenient habitation sites. I suspect that the principal village actually lay in the valley, and that the caches we found represent but one periphery of the habitation area. The graves at a distance of a few hundred yards to the east are also understandable as parts of a cemetery belonging to a village in the valley; and the two house sites between, as we shall show, undoubtedly pertain to a distinct and earlier occupation of the spot and were not contemporaneous with the caches and graves. How far up the creek valley these remains occur, or formerly did, I am unable to say; and I have no basis whatever for estimating the extent of the area of former Indian occupation.

Our interest in the remains at this spot derived largely from the fact that the site is believed, with very good reason, to mark the principal village of the Kansa Indians when they were visited by Bourgmond in 1724 (Remsburg, 1919). The location cannot be verified from Bourgmond's narrative alone, or from Renaudière's statement that 30 leagues above the Quans [Kansas] river—

> . . . a small river [Independence Creek] flowing from the north is found; here is the great village of the Quans [Kansa], consisting of 150 lodges adjoining the Missouri. There are fine prairies to the south and many mountains to the west . . . [Margry, 1886, pt. 6, p. 393.]

Eighty years later, however, Lewis and Clark (Thwaites, 1904–5, vol. 1, pp. 66–68) camped near the mouth of Independence Creek, and so named it, on July 4, 1804, observing that it entered the Missouri ". . . a mile below the 2nd old Kansas Village." They commented further that ". . . this Town appears to have cov$^{d}$. [covered] a large Space."; and note specifically that ". . . M. de Bourgmond, a French officer who Com$^{d}$. [commanded] a fort near the Town of the Missouris in about the year 1724 and in July of the Same year he visited this Village at that time the nation was noumerous and well disposed towards the French." [14] In 1819, Major Stephen Long's expedition ascending the Missouri (James, 1823, vol. 1, p. 113) also passed ". . . a small stream called Independence Creek. A little above and on the south [right] side of the river, is the site of an old Konza town, called formerly the village of the Twenty Four . . ." Other travelers up the Missouri, both before and after Long, likewise noted in their journals or on their maps, the existence of this "old," "ancien," "upper," or "2nd" Kansa village. The tribal identity of the principal historic Indian remains at Doniphan thus seems settled beyond question; and Bourgmond's visit further establishes the site as probably the earliest specifically identifiable Indian village in the State.

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[14] By the Missouri River, Doniphan in 1937 was approximately 443 miles from the Mississippi, and 63 miles above Kansas River. On Chart No. 89, Missouri River mouth to St. Joseph, Mo., 1930–32, mile point 454 on the 1890 thalweg lies ca. 350 yards south by slightly west of the old Doniphan boat landing. As against this figure of 454 miles, measured along an unstraightened channel that presumably approximated that taken by early boat travelers up the river, we have Lewis and Clark's several estimates that the second old Kansa village was 405 and 431 miles from the Mississippi and 67 miles above Kansas River.

As to the archeological evidence for a former protohistoric Indian village of some size on the Doniphan townsite proper, it appears that our rather meager and inconclusive findings may not reflect the true facts. Historical works concerning the locality generally give little information beyond passing reference to hilltop burials seen or opened on the bluffs. An early history of Doniphan County (Gray, 1905) records a visit to the hills near Doniphan by a group of medical students in search of skeletal materials for study purposes—a practice which, if common, may help to explain the seeming paucity of burials today. A later note by Remsburg (1909, p. 2) states that he explored a mound in this vicinity and found remains of a former scaffold burial; also, that there "are numerous stone grave mounds on the hills about Doniphan." Still later, in the only published statement dealing specifically with the village site itself, Remsburg (1919, pp. 1–11) cites a number of old residents to the effect that when the townsite was being developed there were "numerous hut-rings or lodge circles of an ancient Indian village . . . exactly similar to those of the later day villages of the Kansas Indians at Manhattan, Valencia, Council Grove, and other places." The lodge circles, he says further,

> . . . with firepits in the center, were plainly visible in many places . . . [and were] especially noticeable where the public school building now stands. The earth in many places was intermingled with charcoal, ashes, and other debris of the Indian village. Mr. [Luther] Dickinson says that as near as he can remember the rings or circles where the wigwams stood and which were quite numerous, were about twenty feet in diameter and in the center of each was a cavity filled with ashes and charcoal.

Other informants recalled that "large masses of charcoal, pottery, and other burnt substances" were exposed by caving of the creek banks; that in and about Doniphan masses of limestone slabs occurred on and under the ground surface; and that tipi sites, ash, pottery, stone artifacts, etc., were often exposed during roadbuilding and in preparation of the A. & N. Railroad grade through the town. Mounds and stone-covered burials were said to have been plentiful on the adjacent hills; and on the authority of McCoy and Morehouse, Remsburg says the Kansa frequently buried their dead beneath stone slabs. Curiously enough, there appears to be nowhere a detailed description or adequate illustration of the innumerable artifacts said to have come from the townsite; and it is utterly impossible to determine whether one or several cultures were represented, or to evaluate the remains in light of present knowledge of Missouri Valley archeology.

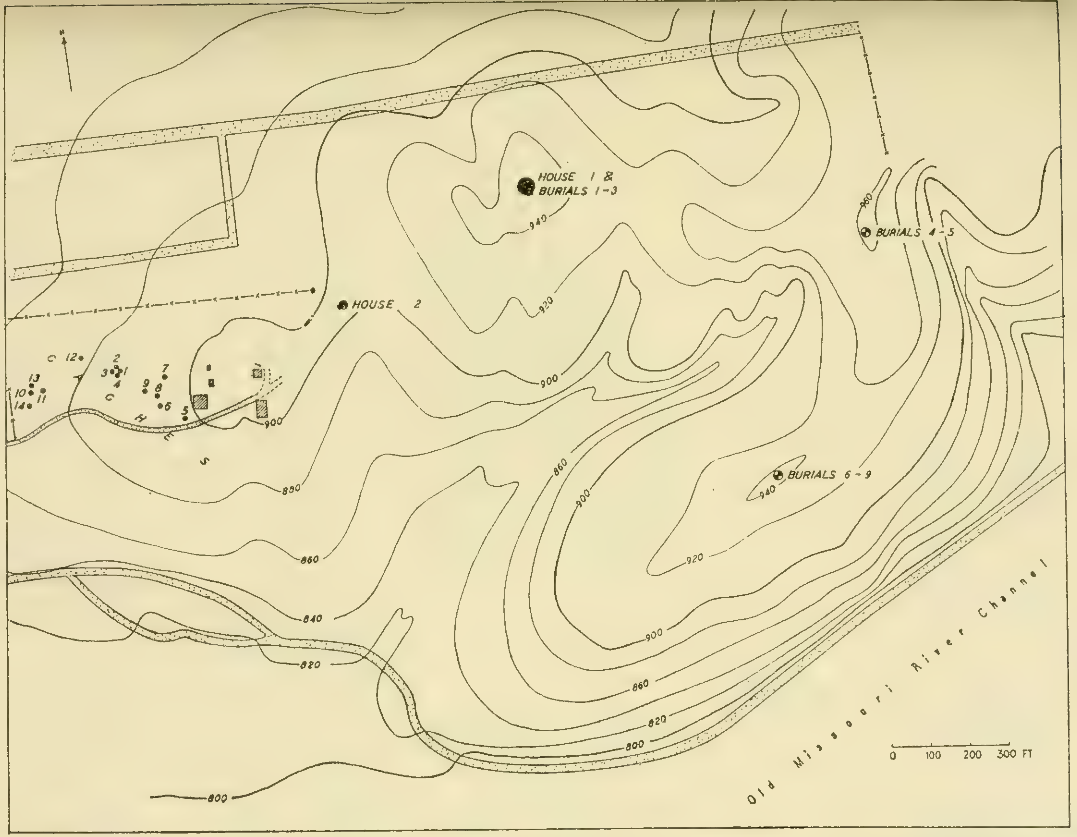
The remains described below, as already indicated, were found on the east slope of the creek valley near its mouth and on the overlooking ridge. All were within 300 yards of the river face of the bluffs, and not more than half a mile from the main road through Doniphan. They lay on property owned by George Meidinger, to whom we are under obligations for permission not only to dig but also to camp in the temporarily abandoned farmstead area on the site. The excavations were carried on from July 1 to 23, 1937.

### CACHE PITS

The cache pits we opened were scattered down a sloping hillside (fig. 5) below the Meidinger farm buildings, running from the 900-foot contour westward to the 870-foot contour, at a point about 250 yards from the main road through Doniphan. All were in an area measuring about 65 by 130 yards. One pit had been sectioned by the winding drive to the farmstead; the others lay north of this road, and all were concealed from the main river valley by a slight shoulder of the hill. The location was well chosen for purposes of drainage; but it has a northwest exposure and must have been windswept and bleak during the winter months.

With exception of the pit sectioned by the driveway, there was no clear indication of remains on this spot prior to actual tests. Close inspection of a group of molehills, however, disclosed bits of charcoal and one or two small sherds, and a little digging revealed darkened earth below mixed with more charcoal, burned clay daub, flint chips, and bone fragments. This sort of mixture, consisting obviously of refuse, characterized the fill in all of the pits, and set them off clearly from the surrounding undisturbed red-brown clay subsoil.

That most of the pits opened on the slope here were actually old cache pits secondarily used as trash dumps, is indicated by their general regularity in form and the conformity in size, shape, and other details to the similar pits found in other Plains Village Indian sites. Characteristically, they were circular in plan, with the floor slightly exceeding the mouth in diameter, and of medium size and depth. The diameter varied from 3 to nearly 7 feet, the depth from 2 to 5 feet. There was no evidence of burning of the walls, or of grass, skin, stone, or other floor coverings. The fill, generally less compact than the en-


N
HOUSE 1 &
BURIALS 1-3
BURIALS 4-5
BURIALS 6-9
HOUSE 2
940
960
920
900
880
860
840
820
800
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2
3
4
5
6
7
8
9
10
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C
H
E
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Old Missouri River Channel
0 100 200 300 FT

FIGURE 5.—Contour map of portion of Doniphan site, 14DP2, showing location of historic caches and burials and prehistoric house sites excavated by U.S. National Museum, 1937. Stippled bands indicate roads.

closing subsoil, contained quantities of animal bone, lenses of ash, mussel shells, worked stone and bone, and occasional charred cobs and kernels of corn. Bits of brass and iron, and occasional recognizable objects thereof, as well as glass beads, occurred in most of the pits, though not in large numbers. From several were taken lumps of grass- and twig-impressed clay daub, in all probability from the ruins of earth-covered dwellings that once stood nearby. Sherds were disappointingly scarce and small.

Location of the pits opened is shown on the site map (fig. 5); their dimensions and contents are summarized in table 1.

TABLE 1.—*Summary of dimensions and contents of pits opened at the Doniphan site (14DP2)*

| Pit No. | Diameter | | Depth | Remarks |
|---|---|---|---|---|
| | Top | Bottom | | |
| | *Inches* | *Inches* | *Inches* | |
| 1 | 40 | 42 | 24 | Ashy fill, with lumps of clay daub; animal bone, copper scrap, sherds, etc. |
| 2 | 74 | 72 | 45 | Clay daub, iron, sherds, bones, etc. |
| 3 | 103 | 65 | 50 | Little admixture; some bone, metal objects. |
| 4 | 90×70 | ---------- | 55 | No data. |
| 4A | 40 | ---------- | 43 | Sherds, catlinite, iron, clay daub, etc. |
| 5 | 60 | 68 | 43 | Copper; iron; stone club head, etc. |
| 6 | 43 | 80 | 60 | Lead cross; copper, iron; glass beads; catlinite; pipes; worked and refuse animal bone; sherds; etc. |
| 7 | 128×50 | 128×50 | 36 | Sherds, flints, iron, copper, etc.; shape unusual, possibly two overlapping or intersecting cache pits. |
| 8 | 36 | 44 | 34 | Cylindrical neck 10 inches deep; sherds, iron, copper, catlinite, etc. |
| 9 | 42 | 52 | 53 | Cylindrical neck 15 inches deep; flints, sherds, etc. |
| 10 | 50 | 54 | 31 | Bone refuse, stone, metal, bone tube, catlinite, etc. |
| 11 | 78 | 55 | (?) | Bone refuse, worked bone, sherds; no metal or glass. |
| 12 | 54 | 57 | 58 | Bone refuse, charred corn, etc. |
| 13 | 45 | 50 | 36 | Catlinite pipe, bone needle, copper, iron, chert points, etc. |
| 14 | 50 | 48 | 48 | Sherds, flint and antler artifacts, metal, etc. |

Pits 3 and 4 possibly were not cache pits. Aside from their greater size (table 1), both were oblong in plan, with walls vertical or insloping at the base, and they lacked the regular shape of the usual caches. The fill, moreover, contained a much smaller proportion of refuse and artifacts. That they were from the same general time period as the caches is evidenced by the presence of bits of metal along with aboriginal materials. It was surmised that these basinlike affairs might have been borrow-pits, from which earth was taken to plaster house walls or to cover earth lodges, and that subsequently the holes were incidentally filled up with earth containing a little trash. Since the type of house used by the people who built the caches is not known, the above surmise as to borrow-pits must be regarded as a guess.

So far as the presence of orchard trees here permitted, we carefully test-pitted most of the area about and among the caches in a search for house sites. The likeliest spot included pits 1 to 4 and the intervening area, where lumps of fire-hardened clay daub, many of them grass- or twig-impressed, were scattered throughout the topsoil. Despite careful stripping of this area to subsoil, however, we found no trace of postmolds, fireplaces, floor lines, or other house features. Uniformly negative, also, were our tests elsewhere in the orchard and southward across the farm driveway. Bits of clay daub were noted in several of our tests, but in no instance could they be traced to a recognizable habitation unit. The negative results of our search cannot be considered final and conclusive, and it is still possible that remains of house units coeval with the caches could be found by more exhaustive testing. It is perhaps equally likely, however, that the dwellings from this period were mainly on lower and less exposed ground to the west or northwest, or that, instead of substantial earth-covered pithouses, they were surface affairs with bark or mat coverings which would leave few or no traces after the lapse of a century and a half or more. The clay daub we found may have originated in house ruins of an earlier period, located on the higher points and ridge summits, whence the detritus was carried downhill by erosion, early-day farming, or other agencies.

### HOUSE SITES

East of the cache pit area, on the sloping ridge summit, we opened two pithouse sites. House 1 lay atop a rounded knoll (pl. 1, *b*) about 300 yards east northeast of the Meidinger farm buildings (fig. 5), at the 950-foot contour. House 2 was on a narrow saddle about 200 yards nearer the farmstead, just above the 900-foot contour. Northward, the ground slopes away to a short, dry branch of the Doniphan valley; to the south is a much sharper drop to a deep, heavily wooded ravine opening onto the Missouri River bottoms. Here again our investigations were hampered by presence of fruit trees, so that house 1, the larger of the two, could not be completely cleared. Despite this fact and certain anomalies of form, there can be no doubt, however, regarding the nature and cultural affiliations of these two structures, and of their separateness temporally and culturally from the caches and from the burials yet to be described.

House 1, slightly over 36 feet in diameter, was circular in plan (fig. 6). The floor was generally poorly defined because of extensive activity by burrowing animals; at the periphery it was 24 to 28 inches below the present ground surface, this depth increasing to about 31 inches near the center in the vicinity of the fireplace. The fireplace was a simple unlined circular basin 30 inches across, filled with several inches of clean white wood ash, below which the ground was fire-reddened to a depth of nearly 6 inches. Four large postmolds, marking the location of the primary roof supports, lay at an average distance of about 10 feet from the hearth and formed a central quadrangle measuring roughly 12 by 18 feet. These postmolds were 9 to 12 inches across by 13 to 18 inches deep, and contained charcoal frag-

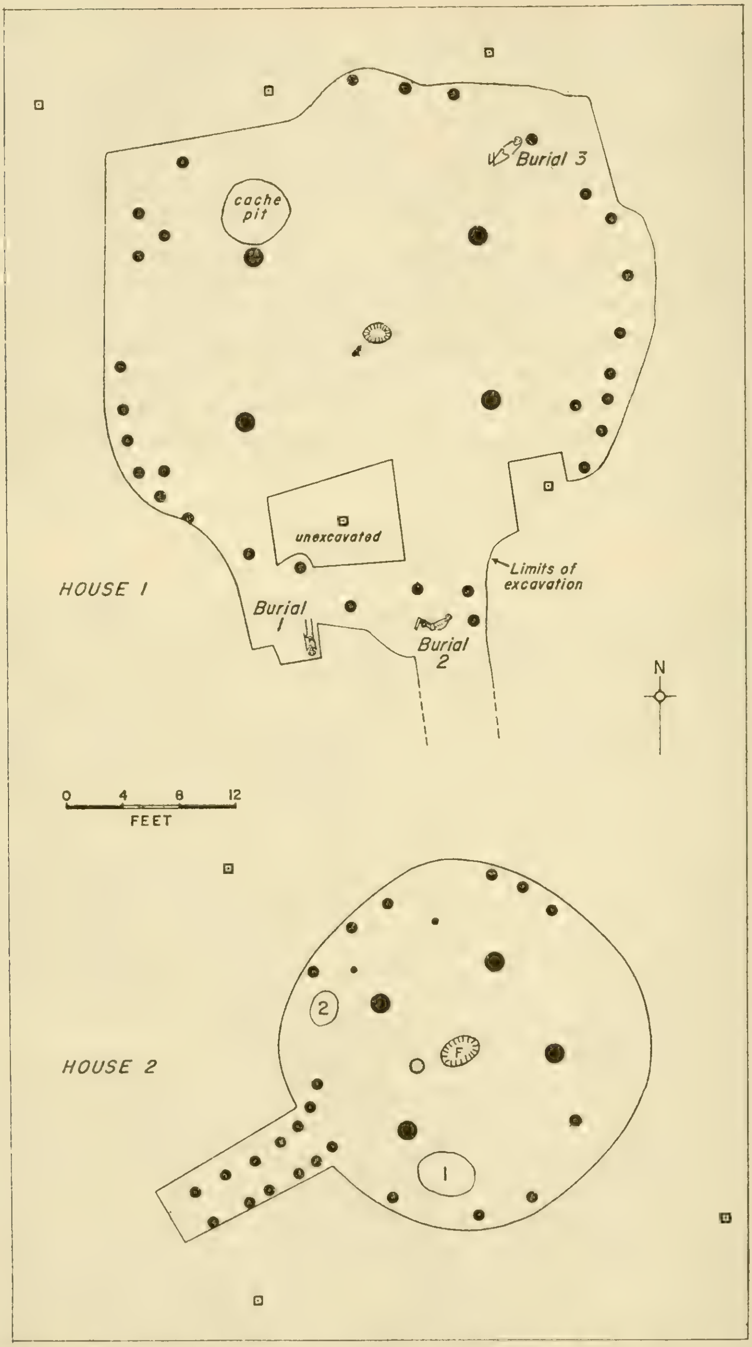
cache pit
Burial 3
unexcavated
Limits of excavation
HOUSE 1
Burial 1
Burial 2
N
0 4 8 12
FEET
HOUSE 2
2
F
1

FIGURE 6.—Floor plans of houses 1 and 2, Doniphan site, 14DP2. Solid circles indicate postholes; rayed ellipses, fireplaces; small nucleated squares, orchard trees. Houses not shown in true relationship to each other.

ments and other trash. Smaller postmolds, 5 to 8 inches in diameter by 6 to 12 inches deep, and spaced at intervals of 15 to 48 inches, lay at a radius of 17 to 19 feet from the fireplace. Undoubtedly some of the longer intervals in this series, as shown in our plan, once contained one or more posts, of which we were unable to find satisfactory evidence. The wall of the house pit rose sharply to the ground surface a foot or two outside this row of secondary roof-wall supports.

Some difficulty was experienced in locating the entranceway, but it seems certain this could not have been toward the east or west. Toward the south, however, mixed earth continued as a strip 3 to 4 feet wide for some 5 or 6 feet beyond the outer circle of postmolds; and two postmolds flanked this strip about 2 feet beyond the circle. This I suspect was the entrance, though if so, it was poorly centered with reference to the house plan generally. The mixed fill rose rapidly, but evenly, to the ground surface, so that a very short passage, or one mostly at or near present ground level, is suggested.

Immediately north of the northwest center postmold was a shallow cache pit 54 inches in diameter, from which came a fragment of clay pipestem, hematite, a few sherds, and other refuse. There were no other caches in the excavated portion, and the only unusual feature of the house otherwise was the presence of a single postmold just inside the outer circle in each of the southeast, southwest, and northwest quadrants. Their significance, if they were used otherwise than for bracing posts, is not clear.

As to the fill within the house pit generally, a typical section south of the fireplace showed 7 inches of loose, light-gray topsoil, obviously disturbed by the plow; 8 inches of dark-gray humus, without cultural admixture; 12 inches of light-gray, poorly compacted soil; and 4 inches of soil heavily mixed with charcoal, burned daub, refuse, and a few artifacts, all of this admixture increasing in abundance downward toward the old floor line. It is probable that most of the darker unmixed fill is of aeolian origin, and was deposited, perhaps with accretions by modern farming operations, in the depression left by the collapsed dwelling. I see no reason to suppose that the abandoned house pit was used to an appreciable extent as a trash dump by other inhabitants of the village or by later peoples; and it is probably safe to conclude that the materials found on and just above the floor and in the single cache pit were left by the original occupants of the structure. All of these materials, to be considered fully in another section of this report, were of aboriginal origin, and include nothing that could possibly be attributed to European trade contacts.

During the excavations in and about the house pit, three burials were uncovered. Burial 1, lying just outside the south wall of the house and about 7 feet west of the probable doorway, was that of a child 6 to 8 years old. The skeleton was extended and supine, with head to south, the right arm at the side, and the left bent over the pelvis. A few inches from the right hand were the remains of a log or wood slab, not certainly worked. The clavicles, humeri, and lower ribs were heavily copper stained. Over the knees were several layers of wrappings. The outermost was of grasses or rushes that do not appear to have been woven, as no certain weft elements could be detected. Under this were several thicknesses of heavy dark-brown skin or leather, among the folds of which lay copper or brass cones, hawk bells, and small circular beads. Beyond much doubt, these articles had once been sewn onto the leather, though none remained clearly attached. The grave pit was about 50 inches long, and the bones lay, fully articulated, from 17 to 19 inches below ground surface (pl. 2, *a*).

Burial 2, also that of a young child about 8 years old, lay partly across the entrance passage and just south of a charred 3½-inch post stump that represented the west unit of the innermost pair of doorway posts. The skeleton was flexed, and lay on the back with knees slumped to the north and the skull to the east, face down (pl. 2, *b*). As with the preceding, the bones were in fair preservation, considering their youthful character. There were no associated artifacts; a large clamshell spoon or scraper a few inches west of the knees may have been in the grave, but positive determination of the association or relationship here was not possible. The intrusive nature of this burial, in relation to the house, was clearly indicated by its position in the entryway and its nearness to the ground surface. The cranium was a scant 3 inches underground, the knees about 6 inches, and all bones were above the floor of the probable doorway. Obviously, had the doorway been cut after the burial was laid down, the bones of the upperbody would have been displaced and there would have been clear evidence of disturbance. Thus, despite the absence of diagnostic or datable artifacts, it is evident that burial 2 postdates house 1; and it is probably safe to conclude further that it belongs to the same period and culture as the other two burials nearby.

Burial 3, an adult male (?), with cranial sutures partly obliterated, was in the northeast part of the house pit just within the outer series of postmolds (pl. 2, *c*). The skeleton was on its back, semiflexed, i. e., with the knees extended but bent and the feet doubled back against the body; the right arm lay at the side in good order, the left had been disturbed. The long axis of the grave ran northeast to southwest, with the head of the burial at the northeast end. There were no artifacts or wrappings. The grave pit had barely penetrated the house floor, and virtually the entire skeleton lay above the floor level, thus establishing the intrusive nature of the interment.

House 2 (pl. 1, *c*), visible before excavation as a slight depression with dark fill, was also circular in floor plan (fig. 6). Located on a sloping ridge, it varied in depth from nearly 48 inches on the east (uphill) side to 18 or 20 inches on the west. The somewhat oblong fireplace was 26 inches in diameter; it contained only traces of ash, but was underlain by 4 inches of burned earth. At a radius of 6 to 7 feet from the hearth were four large postmolds, and at 12 to 13 feet radius was an incomplete circle of smaller postmolds. This outer series was exceedingly difficult to trace, but the posts seem to have been set at intervals of 2 to 4 feet. A foot or so beyond, the floor line curved sharply upward to form a vertical wall and gave a maximum pit diameter of 25 to 26 feet. The entrance passage, as poorly centered as that on house 1, opened to the southwest, down the ridge. Averaging about 30 inches in width, it was marked by 5 pairs of postmolds extending 10 feet beyond the walls of the house pit.

Two caches and a small pit of uncertain purpose were found in this house unit. Cache 1 was south of the fireplace, between the primary and secondary series of postmolds. It was 42 by 30 inches in diameter, with a depth below floor level of 36 inches; the walls were vertical and the unlined floor was flat. The well-mixed ashy fill included many sherds, a restorable vessel (USNM 381644; pl. 4, *b*), a clay pipe, and other odds and ends. Cache 2, somewhat similarly situated at the west side of the house, was 48 by 32 inches across and 24 inches deep. Sherds, two restorable vessels (USNM 381621–22; pl. 4, *a*, *c*), flints, charred corncobs, etc., were taken from the fill. The third pit, 14 inches across by 17 inches deep, lay about 2 feet from the fireplace, between it and the doorway. The walls converged to a bottom 10 inches across. A few sherds similar to those from the house floor generally were the sole contents other than mixed soil.

In addition to the artifacts from the caches, a considerable amount of broken pottery was collected from the floor and the fill immediately above. Fragments of a small restorable jar lay on the floor about 6 feet southeast of the fireplace, and a polished celt was found just south of the west primary postmold. The material in general conforms closely to that from house 1, is strictly of aboriginal manufacture, and parallels closely that from Nebraska Culture sites farther up the Missouri (Strong, 1935).

### BURIALS

In addition to the three burials described above in connection with the clearing of house 1, we uncovered the remains of eight other individuals. These occurred in two small groups, or plots, of four graves each (fig. 5). Burials 4, 5, 10, and 11 were on a knoll about 300 yards east of house 1 and near the head of a deep draw. Burials 6 to 9 were about 200 yards to the south and west, and a little over 300 yards southeast of house 1, from which they were separated by the same deep draw. The point on which the second group was situated directly overlooks the Missouri River bottoms and offers a splendid view down the bluff-bordered valley.

Burial 4, an adult male, had been placed in a semisitting position with legs extended to the east by south, and the trunk bent sharply upward to bring the skull within 3 or 4 inches of the ground surface (pl. 2, *d*). The head and shoulders were slumped to the right, with the face down. The legs, 15 inches underground, were partly covered by limestone slabs, and on the surface nearby were other slabs that had apparently been dragged by the plow from a position covering the upper parts of the skeleton; probably the entire grave was originally slab covered. The bones, particularly the skull and limb members, were in excellent condition, and indicate a rather robust individual. There were no associated artifacts.

Burial 5, another male, was 6 or 7 feet southeast of the preceding, and, like it, lay in a short grave about 20 inches deep, with outstretched legs and an upturned trunk. The arms were neatly folded at the sides; the skull had been removed by the plow, but the mandible remained. Also as in burial 4, the long axis of this grave was northwest to southeast, with the legs toward the southeast end. There were no stones on the grave. On the right forearm were four brass bracelets (pl. 7, *i*).

Burial 10 was 15 feet due south of burial 4, and just below plow sole. Another adult male, it lay fully extended on the back, with head to the west and arms at the sides. The left forearm, tibia, and fibula were missing. There were no slabs or artifacts in the grave (pl. 3, *c*).

Burial 11 was immediately east of the preceding, the two graves being separated by little more than a foot of undisturbed soil. An adult female, it lay extended and partly on its left side in a curving position, with the feet at the west end and the head toward the southeast. Two large slabs that may once have covered the trunk lay just to one side and still partly over the bones (pl. 3, *d*). There were no artifacts.

The second burial area found lay on a somewhat lower knoll, some 150 feet above the river bottoms. The slope to the southeast is a steep one, and includes outcrops of limestone from which probably came the slabs used to cover the graves. Burials 6, 7, and 8 were closely grouped in an area measuring about 6 by 10 feet; burial 9 was 15 feet to the west. All evidently represented single interments in individual dug graves, and all showed up on removal of the topsoil as irregular slab-covered areas (pl. 3, *a*).

Burial 6, on removal of the covering slabs, was found in an oblong pit 24 inches wide, 45 inches long, and 21 inches deep. It consisted of a child's skull, lying at the west end of the pit, three carpals, and a pelvis fragment. What had happened to the rest of the skeleton is a mystery, since there were no indications that the grave had been molested. Beside the skull lay four pieces of iron and a polished shell-tempered potsherd.

Burial 7, immediately to the south, was that of a child about 8 years old. The skeleton was incomplete, with the skull and most of the leg bones missing. Interment had been in an extended position, with the body on its back, head to east, and arms along the sides. There were copper stains on the right femur, right humerus, left scapula, and mandible, but no metal was found. The body had evidently been wrapped in a leather shroud, perhaps a bison robe, outside which was a layer of grass or rush (matting?); underneath was a layer of what looked like cedar bark. Blue and white glass beads were in association. Unlike any of the other burials, this one lay on as well as under stone slabs, being in effect sandwiched between two layers of stones.

Burial 8 lay just west of the two preceding; unlike them, it was oriented north to south, the head at the north end. The skeleton, that of a near-adult male, lay on its back in a semireclining position somewhat reminiscent of burials 4 and 5. The skull was broken, either by the plow or by a heavy covering boulder; the other bones, along the bottom of a pit 18 inches deep, were undisturbed and in fair preservation. The mandible was copper-stained, and in the grave fill were glass beads, a brass coil or "Indian razor," and a grayware sherd with punch marks (pl. 3, *b*).

Burial 9 consisted of a few scattered foot bones from an immature individual, lying in a pit 30 inches north to south by 25 inches by 17 inches deep. The disturbance and virtual destruction of this burial is attributable to burrowing animals and not to recent vandalism or farming operations. There were no artifacts in the grave.

In summary, the burials we opened were generally in shallow individual, dug grave pits, more or less clustered on knolls along the top of the river bluffs. The usual position was extended or semireclining, with one flexed, one semiflexed, and two indeterminate examples. Six of the 11 graves were wholly or partly stone covered, the incidence of such covering apparently varying inversely as the distance from the ledges on the south face of the bluff. Thus, burials 1 to 3, farthest back from the outcrops, had no slabs; burials 6 to 9, nearest the ledges, were all stone covered; and of the intervening group, only two of four burials were associated with stones. That sex or age was not a primary consideration in this matter is suggested by the presence of stones on the graves of two children, two adult males, one adult female, and one subadult. Two of the skeletons retained masses of skin wrappings; copper or brass, iron, glass beads, or copper stains occurred on four skeletons, including individuals in all age groups.

The association with metal and glass beads obviously indicates a post-European contact dating for at least some of the burials. The general uniformity of interment practices, as shown by prevalence of extended burials, use of slabs in or over the upper part of at least half the graves, and the generally good preservation of the bones, lead me to believe that all the burials are to be attributed to the same general time period, and that even those without offerings postdate the arrival of European influences in the locality. That they are later than the two house sites we opened has been indicated elsewhere. In all probability, they belong to the same general period as the early-contact cache pits west of the farm buildings, and are part of the evidence of a post-European contact occupancy of some permanence and magnitude. If this reasoning is correct, both caches and burials can hardly be anything other than Kansa remains of the 18th century; and houses 1 and 2, for which a Nebraska Culture affiliation can be demonstrated, are in all likelihood pre-Kansa.

## MATERIAL FROM THE HOUSE SITES (NEBRASKA ASPECT)

From the two house sites opened and the included cache pits came most of the pottery recovered by us at Doniphan. Otherwise, these features yielded relatively little—a few chipped and other stone objects, an antler tool, and a few items of shell. Entirely absent were any traces of metal, glass, or other materials obtained from white men, or of other objects clearly of the post-contact period.

### POTTERY

Pottery from the house sites and included caches totals 370 body and 47 rim fragments. In addition, there are three vessels restored from sherds out of caches 1 and 2 in house 2. Approximately 93 percent of the sherds and all three vessels can probably be assigned to a single somewhat variable ware. This may be described as follows:

#### *Doniphan Ware*

PASTE:

*Texture:* Medium to coarse, usually well compacted, but with a number of porous sherds and others that show a tendency to split along lines parallel to the sherd walls.

*Tempering:* Quartz, feldspar, and mica flakes present; quartz commonly as rounded or worn grains suggesting stream sand, less commonly as angular particles; feldspar and mica probably from crumbled granite; inclusions from 0.5–2 mm. in diameter, rarely up to 4 or 5 mm.; present in variable amount, sometimes barely visible, at other times so abundant as to give a gritty feel to weathered surfaces.

*Hardness:* Exterior surfaces range from 2 to 3.5.

*Color:* Core and interior surfaces usually gray to dark gray; exterior varies from buff to brown and gray; firing clouds, especially on exterior.

*Method of manufacture:* Undetermined; no coiling lines show on any fractured surfaces, nor is there any other indication of such construction.

SURFACE FINISH: About 72 percent of the sherds are plain (subtype Doniphan Plain?) and 21 percent are cord-roughened (subtype Doniphan Cord-roughened?). Plain sherds usually have the exterior smoothed, but seldom approaching a polish, and marks of the smoothing tool are often visible. Cord roughening was apparently an all-over treatment with cord-wrapped paddle, but the impressions were often almost obliterated, especially on the neck; on some pieces, only scattered traces of the roughening are still visible. The cord impressions vary widely in texture, spacing, and other details. Interior surfaces are carelessly smoothed and rather uneven, often with shallow finger(?) marks remaining.

FORM:

*Vessel shape:* Medium-sized to large globular jars, showing in profile a nearly uniform curve from neck to base, with little or no flattening of the upperbody; greatest diameter is usually just above the vertical midpoint of the jar (pl. 4). No bowls or other shapes recognized in the sherd materials.

*Rim:* Simple, unthickened or very slightly thickened, recurved and outflaring, very rarely vertical; varies in height from 15–35 mm. above constricted neck.

*Lip:* Generally rounded, unthickened, plain.

*Base:* Rounded bases only are indicated in our sample.

*Neck:* Generally is merely juncture between rim and upperbody, always apparently less in diameter than the maximum body dimension.

*Vessel size:* Range uncertain, but up to at least 22 cm. high and 26 cm. in diameter; larger vessels suggested by some sherds.

*Thickness:* Vessel walls 3–12 mm., probably average between 5 and 8 mm.

*Appendages:* Vertically set strap handles, usually narrow and plain, connecting lip and upperbody, apparently two per vessel; also vertical loop handles, possibly attached by tenons, from upper rim (not lip) to body, two per vessel; neither loops nor straps show any decoration (fig. 7, *a*, *b*).

DECORATION: Almost wholly absent. One vessel (pl. 4, *b*) with two loop handles now missing shows splayed or spread-finger applique arrangement at lower attachment of handles; between handles are three horizontal rainbowlike designs, each of three concentric incised lines curved upward. One rimsherd with pinched or scalloped edge recalls Gunnerson's (1952, p. 42) type McVey Pinched Lip from eastern Nebraska; other pieces from a small vessel have applique rim decoration suggesting his McVey Pinched Fillet (ibid., p. 43).

So far as one may judge from the sherd sample, the three restored vessels are probably fairly representative of the pottery complex at Doniphan. The largest of these (pl. 4, *b*), restored from sherds taken from cache 1, house 2, has a maximum body diameter of 26.5 cm. and a height of 22.5 cm. The exterior surface has been carelessly smoothed, and shows no traces of cord roughening. The fingerlike treatment at the lower point of attachment of one of the two now missing handles and traces of the incised rainbow decoration between these features are shown in the illustration. A second plainware piece (pl. 4, *a*) from cache 2, house 2, measures 23.8 cm. in diameter by 19 cm. in height; its smoothed surface bears numerous striations but no markings that could be considered decorative. The third specimen, also from cache 2, house 2, is the smallest of the lot, with a body diameter of 22.2 cm. and a height of 17.1 cm.; its surface from the neck down carries cord roughening, and like the two preceding pieces, it has two oppositely placed handles connecting lip and upperbody (pl. 4, *c*).

Two sherds comprising about a quarter of a miniature vessel were found on the floor of house 1. They suggest a small pot duplicating in clumsy fashion the shape and other features of the larger vessels above described. The vessel was apparently between 5 and 6 cm. high and had a maximum body diameter of about 8 cm.; it had a constricted neck, low rolled rim, and apparently two small loop handles connecting the lip and upperbody. The exterior surface is cord roughened.

Also from the house sites and included caches came 22 shell-tempered sherds. These are nearly all plainware and seem to average slightly thinner than the grit-tempered ware above described. Two bear incised decoration which was apparently on the body of the vessel. In one case the lines form a crude inverted V, with the lines deeply and not very skillfully cut. The other is a thin hard piece, well smoothed. On what was evidently the shoulder and upperbody of the vessel there seem to have been finely incised, paired, vertical lines at intervals of approximately 35 mm.; between these pairs were placed upward-pointing chevrons, at least 10 in number. The lines are thin and deep; and the whole "feel" of the piece is foreign to the Doniphan site. There is a suggestive similarity between this piece and some of the thin, hard, dark-gray sherds with incised decoration from Nebraska Culture sites in eastern Nebraska; and I suspect that the sherd in question is not a local product, but was made perhaps by a Middle Mississippi people residing somewhere in the general area (fig. 7, *d*).

From pit 1, house 2, was taken a single small grit-tempered rocker-roughened sherd, reminiscent in all respects of the rocker-roughened ware from Hopewell sites in the Kansas City area. I am inclined to think that this is much older than the bulk of the materials from the house sites, and that its occurrence in a house cache is accidental. There are other evidences in the Doniphan locality of earlier Woodland materials; and the occasional mixing of specimens from widely differing time horizons need cause no surprise.

In addition to the pottery vessels and sherds, work in clay included pipes and several clay spheres. From the floor of house 1 came a bent tubular pipe with broken stem; it was made from a roughly molded cylinder 18 to 20 mm. in diameter, with a bowl cavity 8 to 9 mm. in

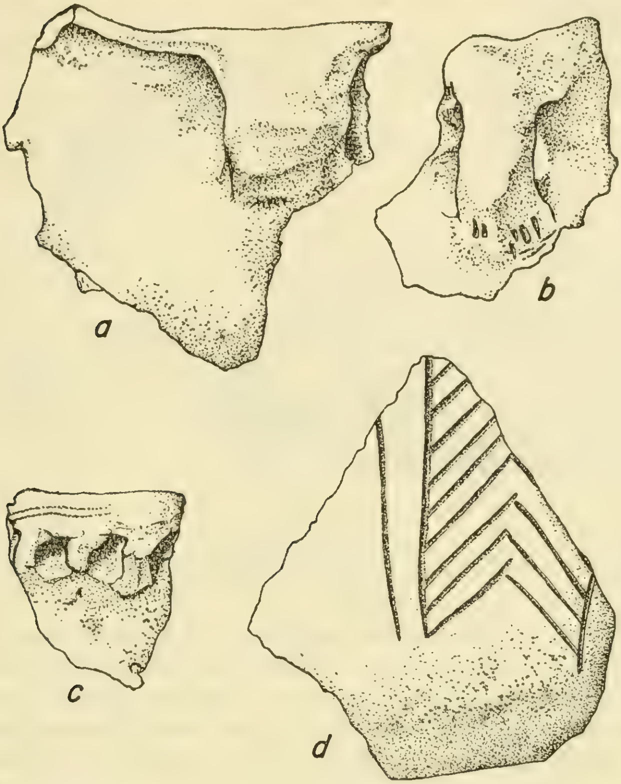

FIGURE 7.—Rim and handle sherds (*a–c*), and shell-tempered incised sherd (*d*) from house 2 (Nebraska Aspect), Doniphan site.

diameter. Below the bend, in what was obviously the stem, the bore diminishes in diameter to about 2 mm. There is no attempt at ornamentation. Length along the outside curve is 69 mm.; how much longer the unbroken pipe was there is no way of determining (fig. 8, *b*). A second piece which I take to be a pipe fragment was taken from pit 1, house 1; it is a massive tapered object, thickly tempered with coarse angular siliceous particles, and has a 3 to 5 mm. bore; whether the bowl continued in the same direction as the stem or curved upward I cannot say. The piece is crudely molded and bears no decoration. The third specimen is a heavy, rather crudely molded, elbow pipe with upright cylindrical bowl and horizontal tapered stem (fig. 8, *a*); in overall dimensions, the pipe is 57 mm. high and 70 mm. long. The top of the bowl is 32 to 35 mm. in diameter, with flat lip, and a bowl cavity 14 mm. in diameter; the stem bore measures 4 mm. in diameter. Beginning at the end of the stem, on each side, there is a single incised line running in a gentle curve upward toward the bowl, only one of these lines reaching the top of the bowl.

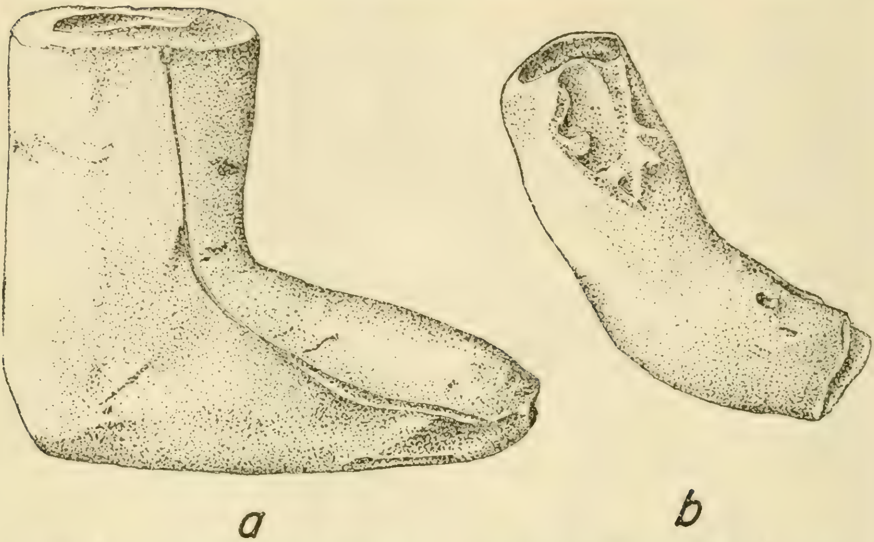

FIGURE 8.—Pottery pipes from houses 1 (*b*, USNM 381624) and 2 (*a*, USNM 381642), Doniphan site. Actual size.

There are three spherical clay objects whose purpose I am unable to suggest. One was apparently shaped with some care and is well smoothed, but undecorated; it measures 25 by 23 by 20 mm. The second is crudely formed and badly cracked, with dimensions of 43 by 30 mm. The third is a baked clay pellet approximately 15 mm. in diameter.

### CHIPPED STONE

Specimens in this category were not plentiful nor do they exhibit especially competent workmanship. The commonest material is a gray or blue-gray chert of uncertain origin; it may be from the Flint Hills area in the Kansas River drainage. Planoconvex end scrapers, 11 in number, tend to be more or less triangular to ovoid in outline, with one flat or slightly curving surface retained from the original spall and the other surfaces ridged or keeled. Maximum thickness is usually at or near the steeply chipped broad end, where the edge formed by retouching and the plane surface tends to show much wear and is sometimes blunted from use. These scrapers range in length from 37 to 70 mm., and in width from 18 to 31 mm. Six of the specimens were found in house 2, five in house 1, in all cases on the floor. There are four side scrapers or knives, consisting of irregularly shaped medium-sized spalls, retouched along one edge for scraping or cutting purposes. Another knife is represented by a portion of thin bifacially chipped flake, tapered at one end and rounded at the other; it is curved and broken, and may have been originally semilunar in outline, with the convex edge, which shows the best retouching, used for cutting. A small thin tapered drill point 12 mm. long is broken off from what seems to have been an otherwise unshaped flake. There is also one small bifacially chipped projectile point, shouldered, with rounded stem and the tip missing; it is 26 mm. long by 11 mm. wide. No other points were found in the houses or included caches.

### GROUND STONE

Work in ground stone includes three specimens. One is a large celt of dark-gray diorite, which was found on the floor of house 1, and measures 20.4 by 7.1 by 5 cm. The entire surface is dimpled from the pecking process by which it was shaped, with grinding found only in a narrow strip along the extreme edge of the blade. The narrow rounded butt is somewhat damaged, as though from pounding, and a heavy calcareous incrustation covers most of one surface. A shorter, heavier, and less carefully made celt from the floor of house 2 is 15.3 by 7.5 by 6 cm.; it, too, has a pecked surface, and the narrowing blade is curved slightly. The butt is unfinished. A large oblong or subrectangular sandstone block found on the floor of house 1 appears to be a muller or rubbing tool. It has dimensions of 22.3 by 14.2 by 7 cm.; the ends and sides have clearly been battered to shape, and the two larger surfaces show the wear that would be expected in grinding. In the absence of any evidence of milling slabs at the site, I am inclined to suspect this handstone may have been used in the processing of hides or otherwise as a rubbing tool, rather than in the grinding of corn. Two irregularly shaped flattened oblong sandstone blocks from house 1 bear deep narrow grooves and grinding facets on their surfaces, and were probably sharpening tools.

Three other heavy stone objects show a minimum of work beyond that needed to shape them for use. One is a thick bun-shaped sandstone cobble, 11.5 by 9.5 by 3.5 cm., which has evidently been split; the edges have been battered and spalled, the convex side is unworked but may have been used some for rubbing, and the split surface remains undressed. An irregular sandstone block, apparently battered to shape, has a sharpening groove on one face and on the other has a small pit 25 to 30 mm. in diameter by 5 to 6 mm. deep; the overall dimensions are 12 by 7 by 4 cm. There is also an incomplete piece of shaped Sioux quartzite, 11 cm. in diameter by 2.5 cm. thick, one surface of which is heavily battered as though from use as a lapstone or anvil.

Other examples of stonework include a lump of pumice with rounded and flattened facets, apparently produced by rubbing; and a single piece of hematite with grinding facets, probably resulting from the removal of pigment material.

### ANTLER AND BONE

The only specimen in this category is a cylindrical, slightly curved section of deer antler, with dressed and smoothed surface (pl. 5, *g*). The "burr" at the base of the antler has been rubbed down, but not completely removed; and there is a very slight depression at the distal extremity, where the cancellous tissue has been dug out to a depth of 2 or 3 mm. The proximal end has been flattened, but is not especially well smoothed. I am unable to say what its purpose may have been.

### SHELL

Five freshwater mollusk shells from house 1 show evidence of modification by man. Two specimens, identified as *Proptera alata megaptera*, have each an oblong hole 23 to 30 mm. long by 13 mm. wide cut or broken through near the center of the shell; neither shows any other indication of workmanship (pl. 5, *b*). There is a fragment of a third shell, similarly perforated. Two other specimens, identified as *Ligumia recta latissima* (Raf), show heavy wear along the margin opposite the hinge, as from scraping or rubbing; the posterior part of this edge has been reduced to nearly a straight line (pl. 5, *a*).

## MATERIAL FROM CACHE PITS AND BURIALS (KANSA?)

With exception of pottery, much the larger part of our collections from Doniphan was taken out of the cache pits opened on the hillside below the old farmstead. These yielded a few dozen sherds, as well as stone, bone, shell, and other artifacts of native origin, and a small but interesting series of metal and glass trade goods. From here, too, came practically all the refuse animal bone, unworked shells, and vegetal material, including corn.

### FAUNAL REMAINS

Animal bone from the cache pits, probably constituting mainly refuse from food-getting activities on the part of the Indians, represented the following species in the numbers indicated.

| | |
|---|---|
| White-tailed deer (*Odocoileus virginianus*) | 73 |
| Black bear (*Euarctos americanus*) | 21 |
| Beaver (*Castor canadensis*) | 11 |
| Elk (*Cervus canadensis*) | 8 |
| Bison (*Bison bison*) | 6 |
| Dog (*Canis familiaris*) | 4 |
| Raccoon (*Procyon lotor*) | 2 |
| Ground hog (*Marmota monax*) | 1 |
| Miscellaneous unidentified fragments | 22 |

This is, of course, essentially a woodland fauna, and indicates that the Indians were drawing freely on the species readily available in and near the timbered valleys of the locality. The small number of bison bones in all probability reflects butchering techniques and hunting practices much more closely than it does the actual use made of that animal, since it is known that the early historic Kansa, like other Indians of the eastern Plains, were making seasonal bison hunts on a tribal basis toward the west. Undoubtedly, the skeletal parts of these animals were characteristically left behind after the butchering and thus did not find their way into the refuse deposits at the village.

A single bird bone from Doniphan has been identified as the metacarpal of a turkey (*Meleagris gallopavo*). This species must have been plentiful in the woods along the Missouri, and it seems rather strange that more remains were not recovered.

Unworked shells of fresh-water mollusks taken from the pits included:

| | |
|---|---|
| *Lampsilis ventricosa occidens* (Lea) | 7 specimens |
| *Lampsilis siliquoidea* (Barnes) | 4 specimens |
| *Leptodea fragilis* (Raf.) | 1 specimen |
| *Amblema costata* (Raf.) | 1 specimen |
| *Lampsilis fallaciosa* (Smith) | 1 specimen |

### VEGETAL MATERIAL

Charred vegetable material representing the remains of foodstuffs was found mainly in three of the pits, but was nowhere abundant. From pit 12 came the remnants of at least 9 corncobs, ranging in diameter from 16 to 26 mm. and in length from 33 to 80 mm. The largest, measuring 26 by 80 mm. but evidently incomplete, shows 14 rows of kernels; five other segments, slightly smaller in diameter, had 12 rows; and three were 10-rowed. In the same cache were a few plum pits and fragments, and one small bit of black walnut shell. Charred kernels of corn, but no cob fragments, also came from caches 4 and 6, the latter yielding additionally three fragments of black walnut shell.

### POTTERY

From 8 of the 14 cache pits excavated in the orchard were taken potsherds, numbering in all about 50 specimens. Of these, 25 plain and 10 cord-roughened pieces appear to be closely similar to the grit-tempered Doniphan Ware found in the two house sites. Most are relatively small by comparison with the great majority of the sherds found in the house sites, and a number show considerable weathering. To me, they suggest material which was perhaps lying on the surface of the ground for some time before it found its way into the cache pits.

The remaining sherds may be divided into two groups—both small, but of considerable interest, nevertheless. One consists of 10 shell-tempered pieces, including 2 rim fragments and 8 body sherds. These apparently represent not less than three vessels, and possibly as many as five. From the area we stripped around caches 1 to 4 came a large heavy dark-gray body sherd, evidently from a large jar; it measures from 11 to 15 mm. in thickness, and most of the exterior surface is scaled or split away. Six body sherds from cache 11 include 5 that are thickly tempered with very fine shell particles, range in thickness from 6 to 10 mm., and are probably from one vessel; and a sixth that is thinner, has much less shell, and shows traces of a former handle attachment at one edge. This latter piece may be from a vessel represented otherwise by a poorly made rim from the same cache; the rim is thin, plain, flares slightly from a constricted neck which appears to have been about 7 cm. in diameter, and shows the stump of a handle or lug attached at the neck. Also from cache 11 is a large thick straight vertical rimsherd between 10 and 13 mm. thick, with very numerous fine shell inclusions; the broad flat lip is decorated with shallow impressions made apparently with the tip of the thumb and the thumbnail, and spaced at intervals of approximately 10 mm.; and there is evidence of a handle or lug attachment about 12 mm. below the lip. The curvature of the rim suggests a vessel with orifice diameter of 28 to 30 cm.; and the lip treatment is curiously reminiscent of that found on some Lower Loup pottery (Dunlevy, 1936, p. 178 and fig. 13, A). A single shell-tempered body sherd from cache 14 is in no way distinctive or outstanding. As elsewhere reported, a single dark-gray plain shell-tempered sherd was found with burial 6, and a smaller shell-tempered sherd with 3 rows of small punctates came from burial 8. It is perhaps worth remarking that the shell-tempered sherds just described from caches 11 and 14 and from the digging around caches 1 to 4, are readily distinguishable from the shell-tempered fragments found in the house sites at Doniphan, and that they are strongly reminiscent of much of the heavy plainware found at the Fanning site on Wolf Creek 16 miles to the north.

Directly associated with the foregoing shell-tempered sherds were two grit-tempered pieces of more than usual interest. From cache 14 came a rimsherd which shows a sharply outcurved profile, a thin lip, and a suggestion of a slight collar about 12 mm. below the lip. The panel between collar and lip bears short, broad, diagonal punctations, which are repeated on the inside from the lip downward. A strap handle, widest at the top, runs from the collar down to the upperbody; it bears three broad vertical trailed lines, and on the lip immediately above are two round punctations.[15] Below the neck may be seen the ends of broad, deep, trailed lines, closely spaced, which evidently ran down onto the body of the vessel (fig. 9). A smaller fragment from the area around caches 1 to 4 is also from a sharply recurved rim, with short deep diagonal punctates on the inner face of the lip and broad trailed diagonal lines of unknown length on the rim exterior. Both these specimens are strikingly similar in all particulars to some of the pottery characteristic of the Lower Loup Focus sites in Nebraska; and I suspect that they originated in that locality rather than among the local potters at Doniphan. A single small simple stamped sherd from cache 3 may also be of northern origin, but is much less distinctive than the two rimsherds above discussed.

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[15] Inspection of the Lower Loup pottery collections of the Nebraska State Historical Society shows sherds from sites 25NC1 (Burkett) and 25BU4 (Barcal) in which the usual lip incisions or indentations similarly give way above the upper handle attachment to contrasting round or oblong punctates. This trait does not appear otherwise in any of my ceramic materials from northeastern Kansas.

Also from cache 3 is a small thin light-brown rimsherd with fine vertical cord roughening on the exterior and a flat, plain, slightly thickened lip. The outer edge of the lip shows two short diagonal impressions from a cord-wrapped dowel; and the interior surface has faint horizontal lines or impressions that may have been produced by fine cords. Unique in our collections from this locality, the piece suggests a late Woodland pottery tradition.

The pottery from the caches as described above is pretty clearly, I think, a mixed lot; and it is probably not indicative of the ceramic complex at any one period of occupation of the site. Numerically, the preponderant pottery is apparently assignable to the Nebraska Culture; but in the caches it occurs with metal and glass trade goods, with worked catlinite, with a few sherds of a heavy shell-tempered pottery-ware, and with occasional trade sherds of probable Lower Loup origin. As we have already noted, the same ware occurs in heavy preponderance in the two house sites and in their included caches, where, however, there is no trace of associated white trade goods or of catlinite. I believe, therefore, that these 35 grit-tempered sherds from the caches represent mainly or entirely surface refuse from the pre-White Nebraska Culture occupancy of the site; that they came to be included fortuitously in the early historic cache pits when the latter were dug through the refuse mantle from the prehistoric Nebraska Culture occupation; and that they therefore represent pottery made, used and discarded long before the time of the Indians who resided here in the early contact period.

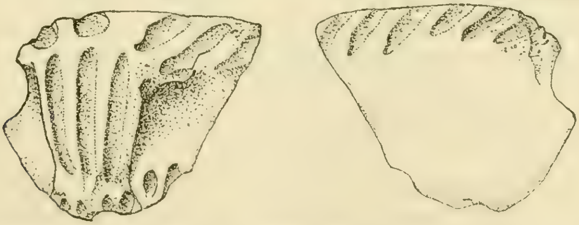

FIGURE 9.—Grit-tempered handle sherd, with decorated inner and outer lip, suggesting Lower Loup pottery from Nebraska; from pit 14, Doniphan site (USNM 381614).

The dozen or so remaining sherds from the caches, including 2 grit-tempered rimsherds of probable Lower Loup origin and 10 shell-tempered sherds, seem to me entirely consistent with the context of white trade goods with which they were found. I suggest that the 10 shell-tempered sherds represent a locally made utility ware of probable Kansa manufacture; that the Lower Loup sherds indicate contacts between the Kansa at the Doniphan site and a protohistoric 18th century Pawnee (Lower Loup) people in east-central Nebraska; and that all these sherds, along with the white trade material, are in line with what might be expected in a Kansa village community of Bourgmond's time, i. e., circa 1724.

### CHIPPED STONE

Artifacts of chipped stone were few in number and inferior in workmanship; most were fashioned from the same gray and blue-gray chert represented in the chipped implements found in the house sites. Five pieces may be classed as end scrapers; they have the general planoconvex form of the familiar Plains scraper type, but are generally thicker, heavier, and less carefully shaped and finished than those from sites farther west. The working edge seldom shows much retouching; in one example only is there clear indication of blunting of this edge from long use. In size, they range from 50 by 38 by 15 mm. upward to 76 by 54 by 27 mm. One irregularly triangular spall measuring 78 by 40 mm. has one edge retouched, and was probably a side scraper. There are seven projectile points, all triangular in outline and unnotched, and ranging in size from 20 by 11 mm. to 46 by 23 mm. They are bifacially chipped, but only the smallest shows much evidence of skillful workmanship; most tend to be rather thick, with clumsy or careless flaking the rule.

### GROUND STONE

Work in ground stone includes a few specimens of sandstone, limestone, and catlinite. A carefully shaped sandstone fragment, planoconvex in cross section and with a shallow groove on the flat surface, is evidently part of a shaft smoother; the piece has a maximum thickness of 16 mm. and width of 40 mm. Two other irregular flat oblong sandstone blocks, 70 to 75 mm. long by 42 to 47 mm. wide, have each a single shallow groove on one surface, and were probably also used in dressing sticks or shafts of wood. Of limestone, there is the half of a split hammer or club head (pl. 6, *e*); it was evidently ellipsoidal, laterally compressed, and if originally bilaterally symmetrical, measured approximately 90 by 64 by 51 mm. As this suggests, it was much smaller than the heavy grooved mauls from central Kansas sites, more closely resembling war club heads of historic times. For hafting, the head was provided with a socket 12 mm. in diameter by 24 mm. deep; and the handle that was once set into this hole was further secured by means of a thong which encircled the stone in a shallow flanged groove. The head was split through the socket so as to show about half of this feature and half of the encircling groove. The remaining hammer end is flattened from pounding (fig. 10).

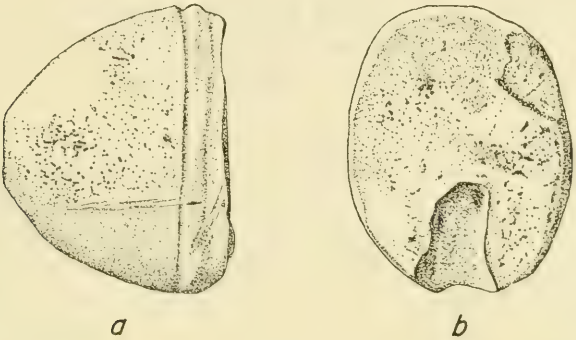

FIGURE 10.—Split limestone club head, socketed and grooved for hafting; from cache 4, Doniphan site (USNM 381587).

Catlinite is represented by a pipe, three pipe fragments, and a large blank, and by four other worked pieces. I cannot say positively that all of the material so classed here is actually from the Minnesota quarries, but a comparison of the Doniphan specimens with the somewhat varied samples of Minnesota stone in the National Museum suggests strongly that the material of which our archeological objects were made may well be from that locality. The one essentially complete specimen is a miniature elbow pipe, 23 mm. long by 20 mm. high by 7 mm. in maximum thickness. The stem is rectangular in cross section, with a high thin comb on its upper surface, and the bowl expands slightly at the top (pl. 6, *b*). The stem end has a shallow conical hole, the bowl a somewhat deeper one; but in attempting to enlarge the latter, the workman broke through the side of the pipe, and left it unfinished. A simple rectilinear design is scratched into each side of the stem, and a zigzag line is lightly incised around the top of the bowl. It seems doubtful that a pipe so small was actually intended for use, since the contents of the tiny bowl would have been consumed at one draw. Two of the pipe fragments are parts of bowls of the so-called Micmac type, broken off at the narrow neck and then split; neither shows any evidence of use, and one bowl seems to have been only partly drilled (pl. 6, *c*, *d*). The third fragment is from a small pipe with cylindrical or slightly expanding bowl. The blank (pl. 6, *a*) was evidently intended for a much larger pipe; it shows the outline of a sizable bowl and a short keeled stem which would probably have extended as a short prow beyond the base of the bowl. In its unfinished state, this specimen is 77 mm. high and has a diameter of 45 mm. near the top of the intended bowl.

Of the remaining four pieces of catlinite, one is a thin unshaped sheet with simple designs scratched lightly into both surfaces. These include an 18-mm. circle bisected by a line, and various other undecipherable motifs. It somewhat suggests the larger and more elaborately decorated catlinite slabs found in Oneota and other sites of the region. Three other pieces have been cut, notched, ground, or otherwise modified, but look like rejectage rather than like unfinished artifacts.

Four roughly shaped blocks of Sioux quartzite, two of which may have been split from larger cobbles, show little or no attempt at further modification; but they are of a size to be grasped conveniently in the hand, and their surfaces suggest some smoothing such as might result from grinding or rubbing action. The smallest is 90 by 35 mm., the largest 115 by 95 by 35 mm. A smaller quartzite pebble, circular and flattened, and measuring 45 by 34 mm., shows battering all around its perimeter, and was probably used as a pecking or hammerstone.

There are also two lumps of pumice showing one or more grinding or rubbing facets, and a lump of hematite with facets from which pigment material has presumably been obtained by grinding or rubbing.

### BONE AND ANTLER

Bone and antler objects were somewhat more numerous than in the house sites, but still represent a very limited range of forms. From pit 10 came a plain tube with finished ends, fashioned from the leg bone of a large mammal (pl. 5, *h*); it measures 11.2 cm. in length by 22 mm. in diameter. From pit 13 was taken a long, flat, curved needle, apparently fashioned from a split mammal rib (pl. 5, *d*). Its length is 26.3 cm. (30.8 cm along the curve); in width it narrows from a rounded butt 10 mm. wide to 6 mm. at the broken tip. There is a 3.5-mm. perforation about 10 mm. from the butt. The needle is worn from use, and shows the marks of rodent teeth along much of the concave surface. Another thin curved piece, with one surface well polished and the other showing traces of cancellous tissue, may be part of a second needle; it is 8 cm. long by about 10 mm. wide, has a rounded butt, is broken at the other end, and is perforated 18 mm. from the rounded butt (pl. 5, *e*). The end of a large bird bone has been cut off neatly and cleanly, probably representing rejectage from the manufacture of a tube or beads.

There are three, possibly four, pieces of worked antler. One is a curved 10.5-cm. section of tine from which the extreme tip has been cut to produce a blunt rounded end; at the other end, the cancellous tissue has been neatly hollowed out to a depth of about 40 mm. The surface has been carelessly dressed down and then rubbed smooth. The piece (pl. 5, *i*) may represent a tool handle, though the need for a socket as large as this is not apparent. Two tines have been detached from shafts of deer antler. In one, this was done by cutting a narrow groove part way around the shaft and then snapping off the tip; but because the groove was inadequate, the break was not a clean one. Fine transverse striae on much of the surface look to me like steel file marks, and there are also some facets near the tip suggesting whittling scars. The second tine, 22 cm. long and bearing marks of rodent teeth over much of its length, appears to have been detached by repeated blows from a steel tool, but is otherwise unmodified. The object shown in plate 5, *c*, is of thinly scraped bone or antler, well finished and smoothed on all unbroken surfaces. One edge is broadly scalloped, and at each scallop is a shallow drilled hole with a short line running down over the adjacent edge. Two incised lines run between the scalloped edge and an 18-mm. cleanly cut hole that has been partly broken away. The purpose of this piece, if other than ornamental, is unknown (fig. 11).

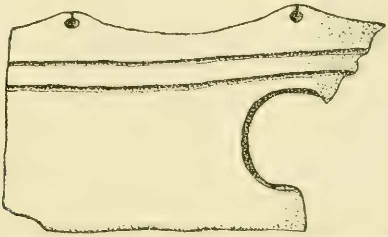

FIGURE 11.—Incised, drilled, and perforated antler or bone fragment from cache 6, Doniphan site (USNM 381594).

GLASS, METAL, AND OTHER TRADE MATERIALS

Glass and metal objects showing intercourse between white men and the Indians at Doniphan came only from the cache pits in the orchard and from burials. None were found in the house sites or in the cache pits within the houses.

Glass beads were found in much smaller numbers than might have been expected when the quantity of metal recovered is taken into consideration. Cache 6 yielded four small white beads, the largest 3.5 mm. in diameter; two of these were small cylindrical specimens about 4 mm. long by 2 mm. in diameter. There was also a tiny much-weathered bluish bead about 2 mm. in diameter. Eight small white beads, averaging 3 mm. in diameter, were taken from burial 8. Burial 7, sandwiched between two layers of limestone slabs and accompanied by leather and rush matting, also had four glass beads—two small white ones and two larger clumsily made oblong specimens 16 mm. long by 7 and 9 mm. in diameter. The last two are diagnosed as follows by Woodward (letter of Dec. 12, 1940):

> . . . The dark blue heavily encrusted iridescent beads are of the type that has occurred most frequently on sites in Alabama, Georgia, California, and Illinois, and occasionally in Pennsylvania and New York.
>
> These are found associated with material pertaining to the early to late 18th century, the average span being from around 1700 to about 1780. I have none of these from the later 19th century sites, nor from those sites of the early or middle 17th century. Other site locations for these beads are Ft. Moore, Ga., where trade goods were carried c. 1690; 18th century sites near Santa Barbara, Calif., 1769–1800; Burial 18, Trading Post site, middle section Macon Plateau, near post, Smiths, Exp. 1936; from Roots, Ill., a burial. The beads vary in length and diameter but have the same characteristic color and shape. Your specimens are more iridescent than most of the beads and this may or may not indicate longer contact with the soil. As you no doubt know, there is no gauge by which we can judge the time it takes for glass to become iridescent. The disease which causes the iridescence acts more swiftly in some instances than in others, depending largely upon climatic and soil conditions.

Iron, brass, and lead are represented in the metal objects, those of iron usually being so heavily oxidized that little can be said regarding their original form. The lead piece is a small cross, with the base and both arms slightly notched; the top is square and has a 1.5 mm. hole for suspension (pl. 47, *d*). The piece measures 20 mm. in height by 16 mm. across the arms; it was made from stock 3.5 mm. wide (fig. 12). Brass sheeting, in irregular scraps and pieces ranging up to 10 cm. in diameter and occasionally showing the marks of a chisel or knife, occurred in several cache pits. A strip from cache 13, measuring 10 by 3 cm., has one edge finely and irregularly serrate (pl. 7, *b*); another has what appear to be two crude hammered-down rivets (pl. 7, *h*). From cache 6 came a flattened brass cone 18 mm. long, probably one of the "tinklers" so commonly attached to garments. With burial 1 were associated 3 rudely made brass cones 16 to 23 mm. long, two of which still retain the knotted leather thong by which they were suspended; and some 33 fringe clips made by clamping strips of brass 2 to 4 mm. wide by 10 mm. long tightly around a thong, these being placed close together so that the thong was practically invisible. The use of such fringe clips has been noted archeologically at Arikara burial grounds of circa 1800–1833 near Mobridge, S. Dak. (Wedel, 1955, p. 159). A badly crushed globular bell, made of thin brass in two parts crimped together (pl. 7, *f*) appears to have been about 3 cm. in diameter; the loop for attachment is a thin strip whose ends have

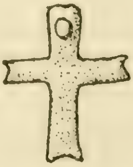

FIGURE 12.—Lead cross, pierced for suspension, from cache 6, Doniphan site (USNM 381597).

been passed through a hole and then bent back against the inside of the bell. There is also a half of a smaller bell, likewise badly crushed. Of heavier stock are several fragments, including three from cache 8 and one from cache 13, that suggest gun parts such as trigger guards or butt plates (pl. 7, *c*). A somewhat similar but ornamented piece with a square iron pin 12 mm. long for attachment is unidentified as to purpose.[16] From burial 5 were taken 4 brass bracelets made of 3-mm. stock; each is more or less elliptical, approximately 45 by 65 mm. in size, and has a 14-mm. opening on one side (pl. 7, *i*). Except in their smaller size, they do not differ appreciably from trade bracelets found in Arikara graves near Mobridge, S. Dak. (Wedel, 1955, p. 155 and pl. 70, *g*, *h*). Burial 8 yielded a 3-turn coil of light brass wire 12 mm. in diameter; whether this was an ornament or a "razor" I have no way of knowing.

Of the 13 iron pieces collected, only 5 or 6 merit further comment. From cache 8 was taken a knife blade 16.5 cm. long by 2.5 cm. wide, with approximately 15 mm. of the shank still attached (pl. 7, *e*). Cache 4 yielded a 23-cm. length of rod of 9-mm. stock; one end is pointed, the other has been bent around to form an eye 4 cm. long (pl. 7, *a*). There is another shorter rod of lighter stock, measuring 10.5 by 0.7 cm.; still another, 16 cm. long, is expanded at one end, which seems further to have been subjected to some hammering. One of two iron objects from burial 6 is a coil of wire 37 mm. in diameter and of about equal length, perhaps an "Indian razor." From cache 5 came a heavy iron band 30 mm. in diameter by 18 mm. long, with a single line near one end.

A sliver of highly polished bone 65 mm. long from cache 11 is in all probability part of a knife handle. The under side is hollowed to accommodate the shank of the blade. Near one end there are two neatly bored rivet holes, 13 mm. apart, through which the piece was split. I suspect this is part of a trade article rather than a native-made local product (pl. 5, *f*).

### SUMMARY AND COMPARISONS

Despite their small quantity and limited range, the materials from the Doniphan site indicate by their nature, their manner of occurrence, and their associations within the site, the former presence of at least two successive Indian communities. One of these was certainly pre-White contact in time, and can be correlated with the prehistoric Nebraska Culture of eastern Nebraska, western Iowa, and northeastern Kansas. The other was as surely post-White contact; and while the complex it represents cannot be very fully defined from the data at hand, it can be assigned with reasonable assurance to an early 18th-century occupation. Documentary sources already cited suggest strongly that this occupancy was by the Kansa Indians. The generalized table that follows summarizes the material assigned to each of these components as detailed in the foregoing pages.

---

[16] C. M. Watkins, associate curator of ethnology, U. S. National Museum, volunteers the information that this piece suggests early 18th century, or older, craftsmanship rather than that of the 19th century (pl. 7, *d*).

*Summary and Comparison of Material Culture Traits at the Doniphan Site (14DP2)*

| NEBRASKA CULTURE COMPONENT | HISTORIC (KANSA?) COMPONENT |
|---|---|
| *Habitations* | |
| Earth lodges, circular, semisubterranean, with vestibule entrance, central hearth, and subfloor cache pits. | No data; cache pits scattered outside of houses. |
| *Burials* | |
| None found. | Individual primary interments, usually extended, with or without stone slabs, wrappings, and limited offerings. |
| *Ceramics* | |
| Doniphan Ware: grit-tempered, plain and cord roughened, fairly plentiful in houses; some shell tempered, including Middle Mississippi incised sherds. | Scarce, apparently shell tempered and of inferior workmanship; Lower Loup sherds as trade pieces. |
| Baked clay balls and pellets, shaped. | |
| *Foodstuffs* | |
| None found. | Vegetal foods include corn and black walnut; animal bone fairly plentiful, representing chiefly woodland and stream valley forms. |
| *Chipped Stone* | |
| Projectile points: only one specimen found, shouldered. | Projectile points triangular unnotched (7). |
| End scrapers. | End scrapers. |
| Side scrapers. | Side scrapers (1). |
| Drill point. | |
| *Ground Stone* | |
| Abraders: awl sharpeners. | Shaft smoother fragments (paired?) and awl sharpeners. |
| Celts, large (2). | Club head, small, socketed and grooved. |
| Muller, large, for grinding or rubbing. | Catlinite pipes, incised slab, etc. |
| Catlinite not found. | |
| *Other Stone* | |
| Pumice lumps, with wear facets. | Pumice lumps, with wear facets. |
| Hematite lumps, with wear facets. | Hematite lumps, with wear facets. |
| Rubbing or pounding tools of tough stone, rudely shaped, with one flat surface. | Do. |

| | |
|---|---|
| *Pipes* | |
| Pottery, elbow and bent tubular forms. | Catlinite, including stemmed, Micmac, and rectangular forms. |
| *Bone and Antler* | |
| Antler: dressed cylindrical curved section. | Tine section, deeply socketed.<br>Tines and tips, cut.<br>Plate, decorated, of antler.<br>Needle, large, flat, of split mammal rib.<br>Tube, large. |
| *Shell* | |
| Musselshells, perforated (3).<br>Musselshells, with worn edge (2). | No worked specimens found. |
| *Trade Goods* (*European*) | |
| None found. | Iron, brass, and lead objects and scraps.<br>Glass beads. |

Allocation of the earlier remains at the Doniphan site to the Nebraska Culture rests on the close similarity between the items inventoried from the two pit houses at Doniphan and those which have been reported by various investigators from Nebraska Culture sites along the Missouri River in eastern Nebraska (Strong, 1935; Bell and Gilmore, 1936; Hill and Cooper, 1937, 1938; Cooper, 1940). The published data on the Nebraska Culture indicate a considerable variation in details from section to section of the area of distribution; but up to the present, unfortunately, the analytical work needed to define these variations and to determine their relationships to one another is largely wanting. At the moment, therefore, only a broad correlation is possible between the Doniphan materials and those from upriver.

With reference to the Nebraska Culture component at Doniphan, there is nothing that falls outside the range of material traits recorded from the upriver sites. The ceramic materials are in all respects close to those from eastern Nebraska. There is apparently a larger proportion of plainware sherds, as contrasted to cord roughened, than in most reported Nebraska Culture sites; but in this respect there is an especially wide variation from locality to locality, and even from site to site (Strong, 1935, p. 252). The rimsherds from Doniphan are virtually all within the McVey series described by Gunnerson (1952, p. 42) on the basis of Sterns' collections. Vessel shapes, as in Nebraska, tend toward the globular jar rather than the round-shouldered form with flattish upperbody that characterizes Upper Republican vessels. And, as in a number of the Nebraska sites, the complex at Doniphan includes smooth shell-tempered incised sherds showing influences, if not direct importation, from some down-river manifestation with Middle Mississippi affiliations (Wedel, 1943, p. 213).

Other traits at Doniphan that conform to recurring Nebraska Culture items include the following: obtuse- and right-angle pottery pipes, the only types found at Doniphan; large ground celts; perforated shell hoes; and shell spoons. The chipped stone objects and most of the few other artifacts are within the range of Nebraska Culture finds; but these involve categories that are rather less diagnostic than the preceding. The very small quantity of material recovered at Doniphan doubtless precludes correlations that, with a larger and more varied sample, would be even more convincing.

The house sites opened at Doniphan are basically like those in eastern Nebraska; but whereas the latter are predominantly square or rectangular with rounding corners, both Doniphan houses were circular in plan. According to Strong (1935, p. 265), Sterns reported three circular houses in his investigations on Papillion Creek in Sarpy County, Nebr. Whether the circular structures at Doniphan represent merely local deviations from the usual form or, alternatively, reflect a trend toward the round earth-lodge form characteristic of later village peoples in the eastern plains, it is impossible to say at the moment.

The early historic component at Doniphan includes so little material that its affiliations cannot be ascertained from the specimens themselves. It was our hope that excavations here and at Manhattan would enable us to define the material culture of the Kansa during the 18th and early 19th centuries and so to make worthwhile comparisons with the Pawnee and other neighboring historic tribes of the region. In this, we were unsuccessful. The evidence from the caches and graves at Doniphan suggests, however, a semihorticultural subsistence basis including maize and the use of storage pits; a series of traits probably or certainly associated with historic peoples, these including use of catlinite, presence of metal and glass trade goods, and perhaps socketed and grooved club heads; the suspected use of crude shell-tempered pottery, along with trade pieces including pottery from protohistoric Pawnee (Lower Loup) peoples on the Loup and Platte rivers of east-central Nebraska; and individual primary interments, such as seem to have been practiced by the historic Kansa. There is in this inventory not much that can be used to set up a Kansa complex; it can only be suggested that there is nothing here to contradict the view that an early post-White contact people resided on the spot, and that this people in light of historic documents were in all likelihood the Kansa.

### SITES NEAR WOLF CREEK, DONIPHAN COUNTY

Some 10 miles below the Kansas-Nebraska boundary, the Missouri River is joined from the west by Wolf Creek. This short and relatively unimportant watercourse, not much exceeding 50 miles in length, heads in the rolling uplands south of Hiawatha, in Brown County, Kans. Thence it flows eastward through a hilly terrain into Doniphan County, where it curves northeastward and finally northward to empty into the Missouri. The valley of Wolf Creek is moderately broad, open, and bordered by sloping bluffs; most of it is under cultivation. In its lower portion, the creek is rather sluggish and muddy, in part presumably because of present-day farming operations and consequent destruction of the native vegetation cover.

No survey of the valley as a whole was attempted by us. Several small village sites were noted within 2 or 3 miles of the mouth of the creek, where flood-free terraces occur (cf. Plank, 1910). These yielded sherds reminiscent of Nebraska Culture wares, as well as a few chipped flints and bits of burned grass-impressed clay from fallen earth lodges. That these would repay systematic excavation, and that additional sites remain to be examined up the valley, I have no doubts. Our own excavations were confined to the largest and best-known village site in the Wolf Creek drainage, and to several obscure and somewhat puzzling burial sites on the uplands some distance back from the stream.

#### THE FANNING SITE (14DP1)

In the lower 5 or 6 miles of its course, the Wolf Creek valley parallels that of the Missouri. Between the two, the upland divide narrows toward the north, and has deeply indented margins. Short timbered ravines, commonly with good springs, drain toward the east and west; between, are less rugged cultivated areas. The locality, among the earliest in the State to be settled by white men, is representative of the broken Missouri River bluffs zone generally.

About a mile east of the easternmost bend of Wolf Creek, and approximately 4 miles south of the creek mouth, is the Fanning site. Located 5½ miles, airline, east of Highland, the site derives its name from the little community of Fanning, a mile to the south. The valley of the Missouri is about 2½ miles to the northeast, across the upland ridge. The site is situated atop a narrow irregular ridge sloping southwestward toward the Wolf Creek valley. On the south is a small unnamed creek; and a scant 200 yards northwest of the main refuse area is a timbered ravine and an excellent spring. A dry gully flanks the east side; on the northeast, the rising ridge connects with the general interfluvial upland.

The site, long under cultivation, has been known to collectors for many years, by reason of its abundant surface remains. It was briefly described by Dinsmore (1912, pp. 53–54), who listed a number of his outstanding artifact finds here and observed further that there was "no evidence of any mounds, but there are at least 20 teepee sites on less than 10 acres of ground." In 1914, Fowke (1922, p. 153) visited the spot and reported as follows on it: "Near the mouth of Wolf River is a village site on which Dr. R. S. Dinsmore, of Troy, has counted 125 tipi sites. Relics are very abundant here, especially the small chert 'thumb-scrapers,' which outnumber all other specimens." A year or two later, Sterns collected materials here for Peabody Museum of Harvard; like others before and since, he noted a similarity between these remains and those at the mouth of Nemaha River (i. e., Leary site). He went on to suggest that the Wolf Creek site was evidently of recent occupancy and probably was assignable to the Kansa.

The visible surface remains today consist of potsherds, flints, animal bone, and other refuse of former human activity, scattered along the ridge summit for approximately 500 yards (fig. 13). A few very slightly elevated and unusually prolific spots suggest middens; and it is possible that features of this sort, more conspicuous in former days, were the basis for Dinsmore's report (1912, p. 54) of 20 or more lodge sites. No house pits or earthworks were noted by us. The width of the refuse zone varies from about 200 yards at the north to 30 yards or less in the south portion; the area of former occupation is estimated at circa 10 to 12 acres.

Near its broadest portion, the site is cut through by a road. This has been deepened by erosion and repeated grading, and along its cut edges may be seen cache pits, refuse dumps, and miscellaneous artifacts and debris. Practically all parts of the site came under our scrutiny at one time or another, but the presence of growing corn prevented excavations along most of the western margin. Wheat stubble covered the main part of the site, but south of the road this had been seeded to clover and only limited tests were permitted. For the most part, therefore, our digging was done north of the road, where the ridge and the detrital zone both attained their greatest width.

Our initial efforts were directed toward the finding of possible subsurface house remains. In the absence of surface indications, these efforts consisted of narrow test trenches dug at random across most of the available stubble-covered area. The normal soil profile was found to consist of 10 or 12 inches of humus topsoil which shaded rather quickly into a brownish clayey subsoil at depths of 12 to 18 inches. Sherds, animal bone, and other debris occurred throughout the upper 6 to 10 inches, i. e., generally to, or but slightly below, plowsole. At greater depths, these materials were found in small spots of dark soil

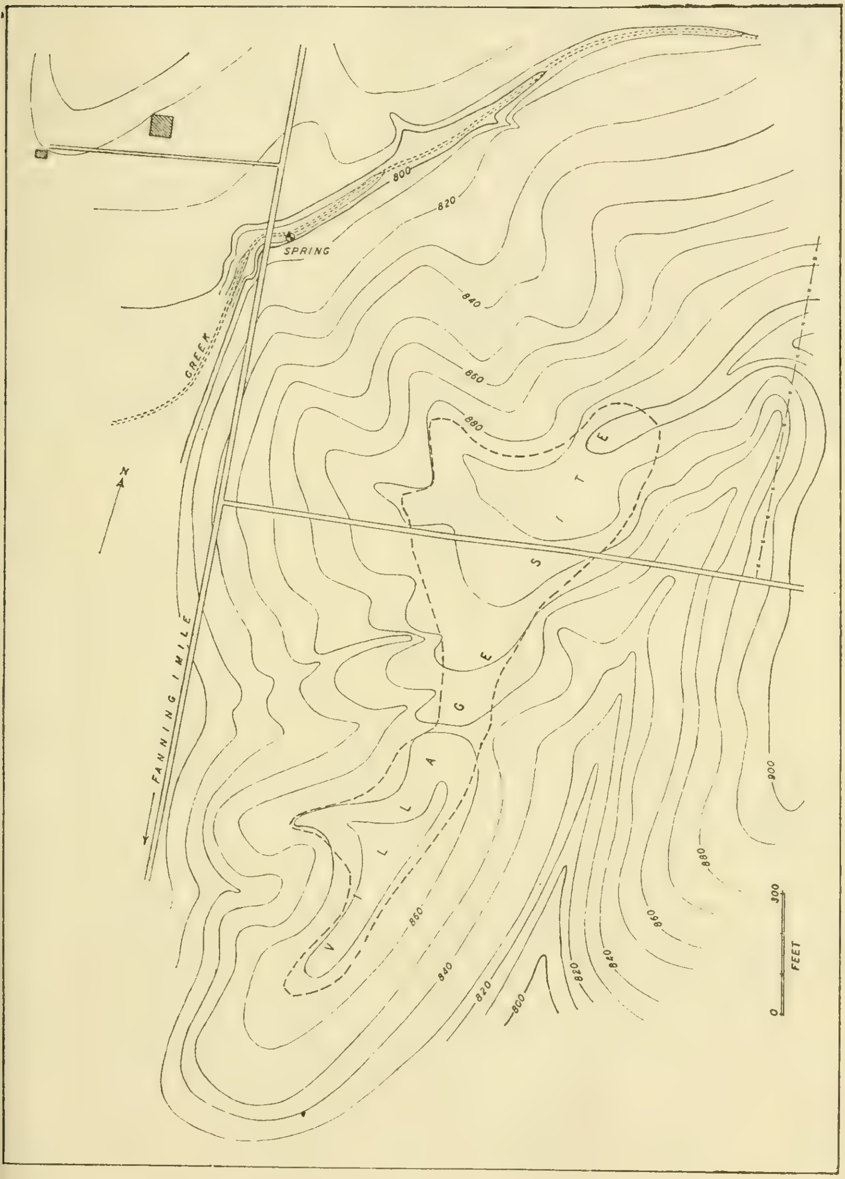
800
820
840
860
880
900
SPRING
CREEK
N
FANNING 1 MILE
VILLAGE SITE
0
300
FEET

FIGURE 13.—Contour map of Fanning site, 14DP1 (broken line), and nearby spring branch.

mixed with ash and charcoal, betokening the presence of cache pits or other aboriginal workings. Cache pits, secondarily used for the dumping of trash, were found to be present in some numbers, as we had anticipated; and the floor of one house site was also located (fig. 14 and pl. 8, *a*).

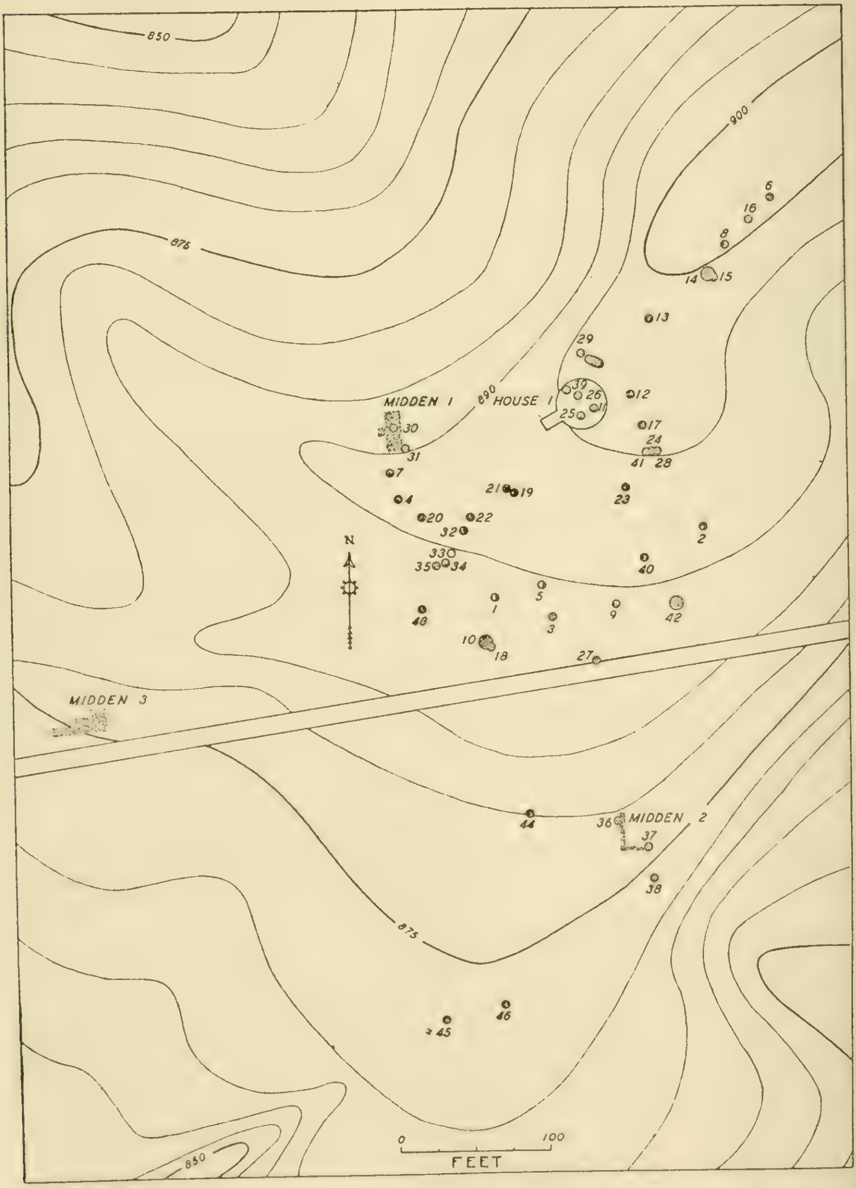
850
900
6
16
8
14
15
875
13
29
39
26
11
25
HOUSE 1
890
MIDDEN 1
30
31
12
17
24
41
28
7
4
21
19
23
20
22
32
2
N
33
35
34
40
5
1
48
3
9
42
10
18
27
MIDDEN 3
44
36
MIDDEN 2
37
38
875
46
45
0
100
FEET
850

FIGURE 14.—Contour map of portion of Fanning site, 14DP1, showing cache pits, house site, and other features excavated.

### HOUSE SITE

The house site lay about 55 yards north of the road, not far from the north edge of the occupation area and overlooking the spring branch. It was circular in outline (fig. 15), with a diameter of circa 30 feet. The fireplace, 30 inches in diameter and filled with wood ashes, lay in the center, not more than 8 or 9 inches underground, and most of the floor area on the south and west sides had been torn up by the plow. Four postmolds marking the former position of the primary roof supports lay east, west, north, and south of the hearth, at a radius of circa 7½ feet; the molds were 10 to 15 inches across by 12 to 20 inches deep. Smaller molds at a radius of 14 to 15 feet, and spaced at intervals of 24 inches, marked the circle of secondary roof-wall supports. The entrance, approximately 48 inches wide by at least 10 feet long, was toward the southwest, opening down the slope. Four cache pits lay within the house limits, but the shallowness of the house excavation and disturbance of the fill and floor by plowing prevented accurate determination of the relationship of caches to house; some,

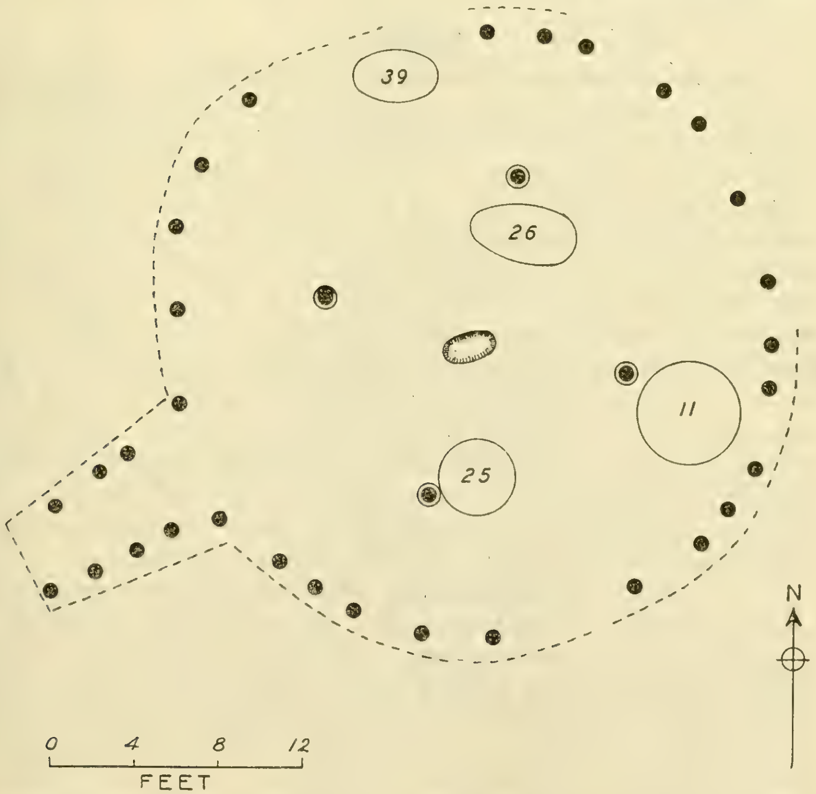

FIGURE 15.—Plan of house 1, Fanning site. Solid circles indicate postholes; rayed ellipse fireplace; numbered circles, cache pits; broken line, approximate edge of house.

all, or none may have been intrusive. Such potsherds and other materials as came from the house fill did not differ from those found in the caches; if the latter were earlier or later, no great time lapse or marked cultural differentiation is indicated.

The structure that once stood here, to judge by the postmold pattern and bits of burnt grass-impressed clay, was in all probability an earth-covered semisubterranean affair of characteristic eastern Plains type. Despite persistent search, no additional house sites were found. Our tests, for reasons already stated, were far from conclusive, and it would not be surprising if further examination disclosed the remains of other similar structures. At the same time, it is clear that with cultivation has come accelerated erosion, and at this late date shallow-lying house pits may well have been mutilated beyond any hope of recognition. There is, too, the strong likelihood that the usual habitations here were neither semisubterranean nor earth covered; if bark or mat-covered lodges placed on the surface were the rule, any traces that survived the active occupancy of the site may have disappeared when the ground was first broken.

### CACHE PITS

Cache pits evidently occur on the site in considerable numbers (fig. 14). No less than 46 were opened during our 3-week stay (table 2). In general, they conformed as to size, shape, and contents to the caches found on most village sites of the later semisedentary horticultural Indians of the eastern Plains. All were circular in plan, or nearly so, with constricted orifices; maximum diameter came at or just above the bottom, which was usually flat. A few had vertical walls, with no significant variation in diameter from top to bottom. Size varied considerably; diameter ranged from 28 to 94 inches at the mouth, and from 28 to 91 inches at the bottom; depth, from 10 to 90 inches. In the deeper pits there was sometimes a cylindrical neck from 1 to 3 feet deep below which the walls flared outward and down. Marks presumably left by the aboriginal digging tools were noted on the clay walls in several instances. In no case were the walls or floor fire blackened or hardened, and in only two or three instances was there any evidence of a charred grass or other vegetal floor covering.

As to contents, the pits generally contained an abundance of potsherds and broken animal bone, with lesser quantities of worked bone, chipped and ground stone, rejectage of artifact manufacture, mussel shells, trade metal, and charred vegetal foodstuffs. This material occurred in an ashy mixed fill, usually quite soft, with bits of charcoal and quantities of dark-gray soil intermixed. Most of our artifacts, to be described presently, came from these pits.

TABLE 2.—*Summarized data on cache pits, Fanning site*

| Pit No. | Diameter | | Depth | Remarks |
|---|---|---|---|---|
| | Top | Bottom | | |
| | *Inches* | *Inches* | *Inches* | |
| 1 | 42 | 60×54 | 56 | Cylindrical neck 30–36 inches deep; floor of light sand covered with ashes; false clay bottom, above which were sherds, 4 antler projectile points, iron, brass hawkbell, etc. |
| 2 | (1) | 55×44 | 19 | Much ash, charcoal, etc.; sherds, charred corn, 2 perforated sherd disks, etc. |
| 3 | 39 | 50×45 | 36 | Fill ashy, mixed with sherds, iron, 3 perforated pottery disks, etc. |
| 4 | 36 | 62×48 | 39 | Fill very hard, little cultural admixture. |
| 5 | 45 | 50 | 55 | |
| 6 | 40 | 56 | 33 | Much ash, sherds, etc., to 24 inches; mixture but no artifacts below 24 inches; iron scraps; sand floor. |
| 7 | 46×36 | 50×40 | 32 | Much ash; copper, sherds, scrapers, etc. |
| 8 | 50×45 | 60×65 | 55 | Clean clay layer at 36 inches; copper scraps, sherds, and general mixture to bottom. |
| 9 | 46 | 64 | 50 | |
| 10 | 94 | 91 | 65 | Very hard fill, much mixture; sherds, brass, iron scrap, corn, scapula hoes, etc. |
| 11 | 61 | 66 | 32 | Fill soft, much charred material, stone, brass, pottery, etc. |
| 12 | 45 | 50 | 16 | Much ash and charcoal; pottery, no metal; layer of black soil at bottom. |
| 13 | 36 | 54 | 44 | Soft ashy fill, with metal, sherds, bones, etc. |
| 14 | 60×65 | 64×74 | 30 | Ashy mixture, some burning of walls; intersected by pit 15 on east side. |
| 15 | 36 | 44 | 18 | Much ash and charcoal; miniature bowl, restorable (USNM 381765). |
| 16 | 56 | 60×52 | 20 | Much ash and charcoal, mixed with sherds, chipped flints, iron, brass, etc. |
| 17 | 30 | 58 | 56 | Very slight admixture at top, increasing toward bottom; charred corn, beans, nuts, etc.; burnt layer on bottom. |
| 18 | 61 | 68 | 60 | Much ash and charcoal; brass scraps, etc.; Lower Loup rimsherd; intersected pit 10. |
| 19 | 56 | 54 | 20 | Very soft, loose, ashy fill; sherds, scapula hoes, scrapers, etc. |
| 20 | 32×48 | 34×52 | 26 | |
| 21 | 55 | 50 | 16 | Much ash in fill; sherds, scapula hoes, scrapers, etc. |
| 22 | 48 | 54 | 21 | Very hard fill; sherds, flints, metal, etc. |
| 23 | 54×60 | 47×58 | 34 | Soft ashy fill in upper 10 inches, very hard near bottom; sherds, flints, bones, metal, etc. |
| 24 | ---------- | 60 | 24 | Little refuse, some sherds, ash, etc.; charred vegetal covering on floor; intersected tops of pits 28 and 41. |
| 25 | 46 | 50 | 20 | Much charred vegetal material, including corn, nuts, seeds, etc.; also sherds, metal, bones; pit was probably inclusive in house 1. |
| 26 | 74×45 | 78×47 | 15+ | Sherds, bone, etc.; clean clay fill in upper part; pit possibly older than house 1. |
| 27 | (1) | 68×48 | 74 | Mostly destroyed by roadcut, except bottom; some ash, few sherds, etc.; white sandy floor. |
| 28 | 48 | 72 | 92 | Much ash; sherds, bones, bone implements, iron, charred vegetal material; Lower Loup rimsherd; flat floor. |
| 29 | 46 | 50 | 30 | Burnt area about mouth of pit; charred corn, some sherds, flints, bone, etc.; no contact material. |
| 30 | 54 | 58 | 48 | Very little mixture, fill very hard; some sherds, bones, etc. |
| 31 | 56 | 49 | 52 | Very soft fill; sherds, scapula hoe, shell beads, bones; no white contact material. |
| 32 | 30 | 34 | 26 | Soft ashy fill; very few sherds or other artifacts. |
| 33 | 28 | 28 | 20 | Little mixture and few sherds, etc. |
| 34 | 35 | 38 | 30 | Much stone, few sherds, little mixture. |
| 35 | 56 | 60 | 44 | Much ash; sherds, copper, bones, etc. |
| 36 | 76×52 | 83×58 | 60 | Much ash and broken pottery; also bones, flints, worked antler, etc.; no white contact material. |
| 37 | 52 | 58 | 32 | Much pottery and ash; also worked and unworked bone, stone, burnt clay, etc.; no white contact. |
| 38 | 82×58 | 88×60 | 46 | Many sherds, bones, charred corn and beans; no white contact. |
| 39 | 54 | 66 | 56 | Sherds, bones, flints, shell, no metal or glass; covered with clean clay, probably antedates house 1. |
| 40 | 50×38 | 54×40 | 34 | Very soft ashy fill; sherds, bones, flints, iron, etc. |
| 41 | 42 | 64 | 90 | Very little material, some sherds, bones, flints. |
| 42 | 72×84 | 72×84 | 45 | Much pottery, bones, etc.; some copper and iron; 12-inch clay layer over most of top, lower fill ashy. |
| 43 | 58 | 50 | 44 | Large grinding slab, catlinite, no white contact material. |
| 44 | 48 | 48 | 10 | Potsherds, scrapers, projectile points, bones, etc.; dark fill, some ash; top removed by farming operations. |
| 45 | 68 | 64 | 30 | Sherds, ash, flints, no white contact; very dark fill. |
| 46 | 30 | 32 | 12 | Sherds, bones, flints, burnt limestone, no white contact; very dark fill. |

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[1] Indeterminate.

So far as our work is concerned, there seemed to be no significant differences in pits or in pit contents from the various parts of the site tested, except perhaps in one detail. We opened 40 caches north of the road, of which at least 17 randomly scattered examples contained bits of copper, iron, or glass. By contrast, of the 6 pits opened south of the road, none yielded trade goods. It might be surmised that a slight time difference is indicated, the older part of the site lying south of the road. I think such a conclusion would be premature at this stage, since we did relatively little work in the latter area, and the sampling can hardly be considered adequate.

### MIDDENS

Three areas presumed to be middens because of comparatively heavy refuse concentration were also tested (fig. 14). One lay 40 yards west of the house site; another, about 90 yards to the southwest on the west hillside, had been partly cut away by the road; and a third was 35 yards south of the road on the east slope of the ridge. About 275 square feet of the north midden, No. 1, were excavated, revealing abundant refuse to 8 or 10 inches and less to circa 15 to 18 inches. Here and there pockets of ash and charcoal were noted, as also occasional small clusters of sherds evidently from a single vessel. Cache pit 30 lay near the center of the excavated area, and pit 31 was at the southwest corner but nowhere was there a recognizable vertical break in the deposit. Below, there was only clean undisturbed subsoil, with no suggestion of house features or any other premidden construction. The materials recovered were uniform throughout, and did not differ significantly from those in the cache pits elsewhere on the site.

The roadside midden, No. 3, some 12 to 15 yards across, was similar to the foregoing in all respects, except that the deposit reached a somewhat greater depth. Approximately 350 square feet of this area was dug over. There was nothing in the potsherds and other artifacts recovered, or in the observed manner of their occurrence, to suggest that the remains belonged to another horizon than that indicated in the house site and the cache pits opened. Both middens, through prolonged cultivation, had been so reduced from their original height and so widely spread that whatever subtle pottery or other changes may have once occurred from bottom to top could no longer be recognized.

The third midden, No. 2, lying south of the road, was found to have been erroneously identified. Excavation disclosed a group of four closely spaced cache pits, one of them quite small, but all containing unusual quantities of broken pottery and stone. Between the pits there was no refuse below plowsole; and on the uphill side, there was virtually no trash beyond the pits. We concluded, therefore, that the supposed midden was a relatively recent development—

a superficial mantle of material dragged from the upper parts of the caches by farm machinery and further spread down the slope by washing rains.

The location of the burial ground, if distinct from the village site, is not known. A few soft bits of human bone—chiefly ribs and vertebrae—were recognized at one point in the north midden at a depth of 18 inches, but no grave outline could be traced. Beyond this we encountered no suggestion of burials. According to local collectors, stone-covered burials once occurred at the south end of the ridge, but no details concerning these could be obtained. A search of the spot revealed a few large stones nearby which had apparently been thrown or dragged down the slope during farming operations, but no proof was forthcoming that these had actually been in association with burials. Moreover, even if the former presence of such graves here were verifiable, it would still be necessary to establish, through association with culturally indicative artifacts, their direct connection with the village site remains. Mere proximity of culturally unidentified graves to the village site is obviously no proof whatever of a direct tieup.

### VEGETAL REMAINS

As was to be expected from its general nature and probable age, the Fanning site yielded relatively little material of vegetal origin. The few specimens found owe their preservation primarily to the fact that they were charred and, as discarded materials, lay in refuse deposits in cache pits well below plow line or other shallow subsurface disturbances subsequent to their deposition. Both domesticates and nondomesticates are represented in our sample.

The only domesticate certainly present was corn, which occurred chiefly as scattered kernels in a number of the caches and here and there in the midden deposits. Of the beans reported in the field notes from several cache pits there is no trace in the vegetal material at hand; they have either been lost or else were erroneously identified in the field. From pit 11 came perhaps half a pint of shelled corn, most of it in small lumps fused by the burning. Among these lumps was one short fragment, about 40 mm. long, of a 10-rowed ear; cob diameter is about 20 mm., and the total diameter of cob and kernels is 37 mm. None of the kernels show any denting. No stalk or husk fragments were noted in the field, despite the fact that the plant was doubtless extensively grown by the natives.

Of the wild fruits, roots, berries, and other nondomesticates doubtless readily available to the natives here, only three species are represented in our excavated material. These include black walnut (*Juglans nigra*), found as shell fragments in pits 17, 25, and 29; hazelnuts (*Corulus americana*), represented by scattered shell fragments in pits

10 and 17, and by numerous shell fragments and half a dozen kernels from pit 25; and papaw (*Asimina triloba*), whose characteristic seeds came from pits 10, 17, and 25.

Since our 1937 investigations at Fanning, additional charred vegetal materials from the site have come to my notice. In June 1955, Fenn Ward of Highland, Kans., called at my office and informed me, among other things, that he had taken from an eroded cache at Fanning a quantity of shelled corn in which were a number of "biscuits," both corn and biscuits having been preserved by charring. On his return to Kansas, Mr. Ward sent me a series of these curious objects. They vary a good deal in size and shape. Some are in the form of small irregular pellets 15 to 20 mm. in diameter; others, slightly larger, superficially resemble a dried plum or prune; still others have a flattened circular shape, measuring 40 to 45 mm. in diameter by 15 to 20 mm. in thickness. The outer surfaces are more or less smoothed and dull black in color, though here and there a glossy area may be seen. The interior varies from fairly compact and fine grained to a coarsely vesicular structure vaguely reminiscent of a charred black walnut. Under a glass, some of the freshly fractured internal surfaces have a somewhat "nubbly" appearance. Each of the seven whole, or nearly whole, specimens I have examined is pierced by a small cylindrical hole 2 to 3 mm. in diameter; and from two of these holes I took fragments of twisted two-ply cordage.

Samples of the corn and "biscuits" were submitted to Dr. Volney H. Jones, University of Michigan Museum of Anthropology. Under date of November 15, 1956, Dr. Jones reported as follows on this material (Report No. 372, Lots 4652–4654, of the Ethnobotanical Laboratory, Museum of Anthropology, University of Michigan):

> The three lots to be described here . . . were recovered from the Fanning Site, Doniphan County, Kansas. All three lots are carbonized but otherwise fairly well preserved.
>
> 1) This lot consists of 15 more or less intact corn kernels and a number of fragments of kernels. The kernels are of rather large size, mostly broadly crescent shape, but some few tend toward wedge shape. The converging angles of the sides suggest that they are from ears having from 8 to 10 rows of kernels. The dimensions are:
>
> *Width:* range 9 to 10.5 mm., mean 9.8 mm.
> *Height:* range 7 to 8.5 mm., mean 7.8 mm.
> *Thickness:* range 4 to 5 mm., mean 4.5 mm.
>
> These kernels fit very comfortably into the conception of the race of corn which has been designated the Eastern Complex. Among the characteristics which can be accommodated readily here are the low row number, large kernels, and broad crescent form. It can also be noted that the kernels on charring have lost their germ areas, a trait which seems to be characteristic of the Eastern Complex. The only negative feature is that some few of the kernels tend to a rectangular form which is not typical of this race. These are in the minority and may be butt or tip kernels which are atypical.

The characteristics and regional and cultural associations of the Eastern Complex have been discussed by Brown and Anderson (1947), Jones (1949), and Jones and Fonner (1954). In aboriginal times it had wide distribution east of the Rocky Mountains, persisting up to historic times in the Eastern Woodlands and Prairie areas. Archaeologically it has very close association with the Mississippi Pattern.

2) The second lot consists of a number of tubers which had been perforated and strung. These vary considerably in size, from about 1.75 cm. to about 4 cm. in greatest dimension. Some of the smaller specimens are complete and globular to egg-shaped. The larger ones have been sliced and are disc shaped with the perforation in the center.

These apparently represent some food product which was gathered and prepared for drying and preservation. In the Prairie region a number of plants furnished underground parts which were used for food. One which suggested itself immediately was the "prairie turnip" or *tipsin* (*Psoralea esculenta*), the preparation and use of which is described by Gilmore (1919, pp. 92–93 and plate 16). It should be noted that in his illustration the product is strung by braiding the tops of the plants together rather than perforating and threading a cord through them. Another product is the water chinquapin (*Nelumbo lutea*), the use of which among the Osage is described by La Flesche (1928, p. 55, and plate 6). His report includes an illustration of the sliced roots strung on a cord. However, both of these products can be eliminated from consideration, on the basis of form and structure.

In every respect, the tubers from the Fanning site compare well with those of the groundnut, *Apios americana* (synonyms: *Apios tuberosa*, *Glycine apios*) and an identification to this species seems warranted. Specimens from our collections were charred for comparison, and checked very closely in size, form, and structure. Particularly significant is that one of the entire tubers from the Fanning site shows points of attachment of rhizomes or root-stocks at *both* ends. The groundnut grows in this manner with the tubers strung along the root-stocks like a string of beads. This accounts for the common names of "rosary roots" and the French "*les racines des chapelets.*" This characteristic does not apply to the other underground food products of the Prairie region insofar as we are aware.

Groundnuts were used for food almost wherever available throughout the Eastern Woodlands and Prairie. Gilmore describes their use by the Indians of the upper Missouri River country, and illustrates the plant and its tubers (1919, pp. 94–95, and plate 17). He also has further discussion of it in Wedel (1936, p. 60) where he reports identification of it from the Hill Site, a historical period Pawnee site near Red Cloud, Nebraska. The only other archaeological find of this plant known to us is from certain of the so-called Ozark Bluff-dwellings of Arkansas, this identification also being made by Dr. Gilmore. This latter identification is reported in a paper by Beardsley (1940, p. 512) in which she summarizes the data on the uses of the groundnut by Indians and presents an analysis of its food value and manner of preparation and use. It should be remarked that in none of the accounts of the preparation of the groundnut is it reported that it was strung as was the Fanning Site specimen. Perhaps this can be attributed to incompleteness of the accounts or to oversight, as such stringing would be a convenience in transporting and in storing and removing from cache pits.

3) The cord on which the groundnuts were strung is about 1.5 mm. in diameter and composed of two strands twisted together in a clockwise (S-twist) direction. The twist is loose and uneven, indicating that no great amount of care was exercised in its manufacture. Cord of this nature is generally made by rolling the

fiber strands on the thigh under the palm of the hand. The material from which the cord is manufactured is coarse inner bark from some tree or shrub, but in its present condition it does not seem feasible to attempt identification to any particular plant. It definitely does not have the structure of rawhide or sinew.

### FAUNAL REMAINS

Mammal bones from the Fanning site represent 13 or more species. The following, listed in order of their relative abundance, have been identified in the material returned to Washington:

| | |
|---|---|
| White-tailed deer (*Odocoileus virginianus*) | 120 |
| Bison (*Bison bison*) | 29 |
| Dog (*Canis familiaris*) | 18 |
| Dog or wolf (*Canis*) | 10 |
| Raccoon (*Procyon lotor*) | 8 |
| Beaver (*Castor canadensis*) | 10 |
| Black bear (*Euarctos americanus*) | 7 |
| Gopher (*Geomys bursarius*) | 6 |
| Elk (*Cervus canadensis*) | 5 |
| Puma (*Felis concolor*) | 1 |
| Lynx (*Lynx rufus*) | 1 |
| Woodchuck (*Marmota monax*) | 1 |
| Opossum (*Didelphus marsupialis virginianus*) | 1 |
| White-tailed jackrabbit (*Lepus townsendii*) | 1 |
| Miscellaneous unidentified fragments | 29 |

With exception of the bison and jackrabbit, none of the above species can be regarded as typically Plains forms. The list, in fact, represents a fair sampling of the animals characteristic of the hardwood forests and tall grass prairies of northeastern Kansas; and probably any of them could have been easily taken along the timbered streams and bluffs and on the prairie uplands within a short distance of the village site.

Bird bones were much less common than those of mammals, and represent only two species. The humerus, a carpometacarpal, several ossified leg tendons, and other bones of the wild turkey (*Meleagris gallopavo*) were taken from the cache pits; and there is also one femur of the red-shouldered hawk (*Buteo lineatus*). Turkeys must have been very plentiful in the heavy woods near the Fanning site, and it seems rather strange that no more of their remains were uncovered.

The coracoid of a snapping turtle (*Chelydra serpentina*) was taken from pit 42. It is remarkable chiefly for its great size. Comparison with the same bone from snapping turtle skeletons of known size in the national collections suggests that the specimen from Fanning (USNM 381876) came from an animal whose carapace length closely approached 500 mm. (20 inches).

The field notes make no mention of finding of bones of fish, and there are none in the Fanning site collections returned to the National Museum.

### MOLLUSCAN REMAINS

The shells of various fresh-water mollusks were fairly plentiful on the site, broken and weathered remnants being turned up at almost any point we tested. Whole shells, unworked and generally suitable for identification, came mainly from the various cache pits. Many of the specimens, when found, still retained considerable portions of the periostracum, or epidermis. The following species were present, listed in the order of their indicated abundance among the whole shells returned for identification to the National Museum:

| | |
|---|---|
| *Amblema costata* Raf | 21 |
| *Lampsilis ventricosa occidens* Lea | 16 |
| *Quadrula quadrula* Raf | 9 |
| *Lampsilis fallaciosa* Smith | 6 |
| *Lampsilis siliquoidea* Barnes | 6 |
| *Quadrula pustulosa prasina* Conrad | 2 |
| *Pleurobema coccineum* Conrad | 2 |
| *Proptera purpurata* Lam | 1 |
| *Tritigonia verrucosa* Raf | 1 |

These mollusks were presumably obtained from nearby Wolf Creek and its tributaries, which I suppose were clean sandy streams prior to breaking up of the natural vegetative cover and consequent heavy silting of the watercourses. There is no way of determining whether, or to what extent, the mussels were used for food. Their burned or crushed shells were certainly extensively utilized in pottery making, the local wares being almost exclusively shell tempered, as we shall point out presently. Possibly the need for the shells in connection with the native ceramic industry was the primary or sole reason for gathering the shellfish.

### POTTERY

Despite the fact that the Fanning site has been frequently visited and surface-hunted by collectors for upward of half a century and has been intensively farmed for an even longer period, ceramic remains still occur in relative abundance both on and under the surface. During our own brief investigations, sherds were the most plentiful materials encountered in the cache pits, middens, and on the ground surface. There can be little question, therefore, that the native inhabitants of the village site were well supplied with pottery of their own manufacture. There is evidence, too, that they were in contact with neighboring peoples who made pottery of quite different character than that typical of the Fanning site. We found no whole vessels, and only two or three pieces could be restored from the sherds we uncovered. I suspect that large-scale excavation of the middens we tested and careful working over of the materials so recovered would bring to light many additional restorable vessels.

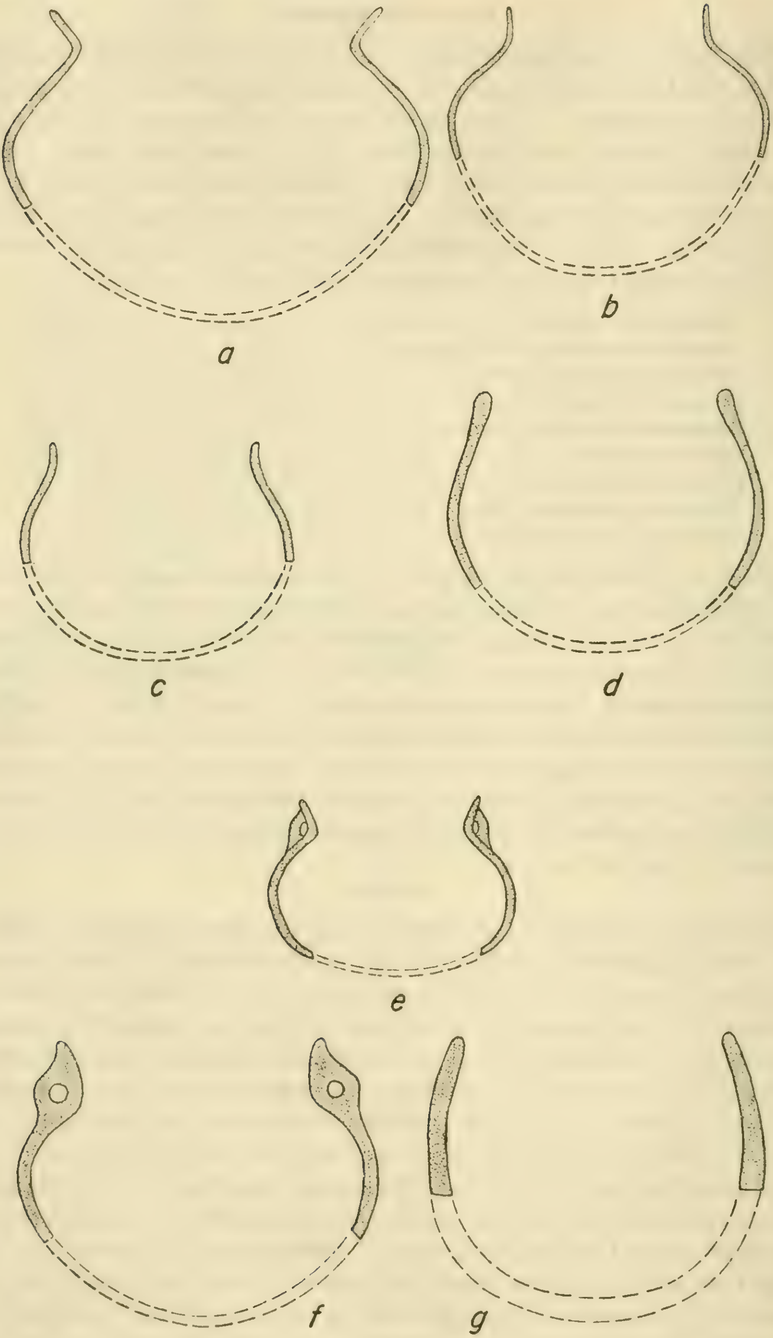

Figure 16.—Vessel shapes indicated by sherds from Fanning site.

Our pottery sample from Fanning comprises 2,026 sherds, including 1,340 body pieces, 632 rim fragments, and 54 handle fragments. Several hundred vessels are probably represented. With regard to their general characteristics—paste, tempering material, surface treatment, vessel shapes, rim form, etc.—the great majority of these sherds apparently represent a single somewhat variable ceramic tradition. There are, to be sure, some differences in the amount of aplastic added, in the thickness and quality of finish of various pieces, and in other details. I doubt, however, that these variations are significant enough to warrant the setting up of distinct types. The most obvious distinction appears to be that between decorated and undecorated sherds; and on this basis I have set up two categories. These have, I think, some validity over and above their descriptive convenience; and I believe, too, that they will help bring out some of the differences observable between the Fanning pottery and that of other related ceramic complexes in the region. It is doubtless true that decoration was usually limited to certain portions of the vessels, notably the upper body and the lip, so that some of the plainware sherds may have come from vessels otherwise represented by decorated fragments. On the other hand, decorated sherds are decidedly in the minority; and most of them appear to be from vessels that were somewhat smaller, a trifle thinner walled, and perhaps more carefully finished than were most of those from which came the body sherds and rim sections that I have classed as plainware.

### *Fanning Plain*

*(Sample: Body sherds 1,150; rimsherds 594; handle fragments 54; total 1,798)*

PASTE:

*Tempering:* Shell, usually in thin flat particles 0.25–2.0 mm. in diameter, seldom over 4 or 5 mm.; sparingly to abundantly used, shell flakes usually oriented in plane parallel to sherd walls; exposed edges often show thin flat cavities where shell particles have been leached out ("hole-tempering").

*Texture:* Medium to fine; usually even, well-compacted, sometimes more or less laminated; fractures usually clean, with little tendency to crumble; very rarely, sherds show tendency to split along line parallel to their surfaces.

*Hardness:* 2.5 to nearly 5, with most of the sherds apparently around 3.5 to 4.

*Color:* Core variable from tan to dark slate gray; surfaces variable from tan to orange-brown to dark gray or nearly black; surfaces of large sherds often show irregular firing clouds.

*Method of manufacture:* Undetermined; no evidence of coiling in the material at hand.

SURFACE FINISH: exterior surfaces usually well smoothed, sometimes almost attaining a polish; commonly with horizontal striae left by the smoothing implement; interior surfaces uneven and less carefully smoothed.

FORM:

*Vessel shapes:* Medium to large full-bodied or globular jars, with rounded base, constricted neck, recurved rim, and often—perhaps typically—with strap handles, are apparently the common form (fig. 16; pl. 8, *b*). Some evidence of deep bowls (fig. 16).

*Rim:* Outcurving or straight outflaring, rarely vertical; from 2–4 cm. high; unthickened and undecorated (fig. 17).

*Lip:* Usually rounded and somewhat thinned, but occasionally nearly flat.

*Base:* No direct evidence, but presumably rounded.

*Neck:* Constricted.

*Vessel size:* Jars apparently range in diameter from 10–12 cm. upward to approximately 30–35 cm. (estimated from sherds); the relative abundance of heavy rim, handle, and body sherds suggests that there were a good many large plainware utility vessels.

*Thickness:* Body sherds average between 4 and 7 mm.; occasional pieces, especially from necks of large jars, may reach thickness of 12 mm.

HANDLES: Strap handles are highly characteristic, loop handles and lugs much less so; probably two and sometimes four per vessel. The ends are blended into the vessel fabric, the upper end usually 5–10 mm. below the lip and the lower end on the upperbody below the neck. There is no evidence of riveted or tenoned attachments, and in no case does the handle rise directly from the lip. Two forms of strap handles may be recognized: (*a*) Tapered straps (57 specimens), narrowest at the lower end and widening as they rise to the rim. In size, the smallest widen from 15 to 25 mm., the largest from 3–5.5 cm.; they are from 2 to 5 times as wide as they are thick, and have a flattened

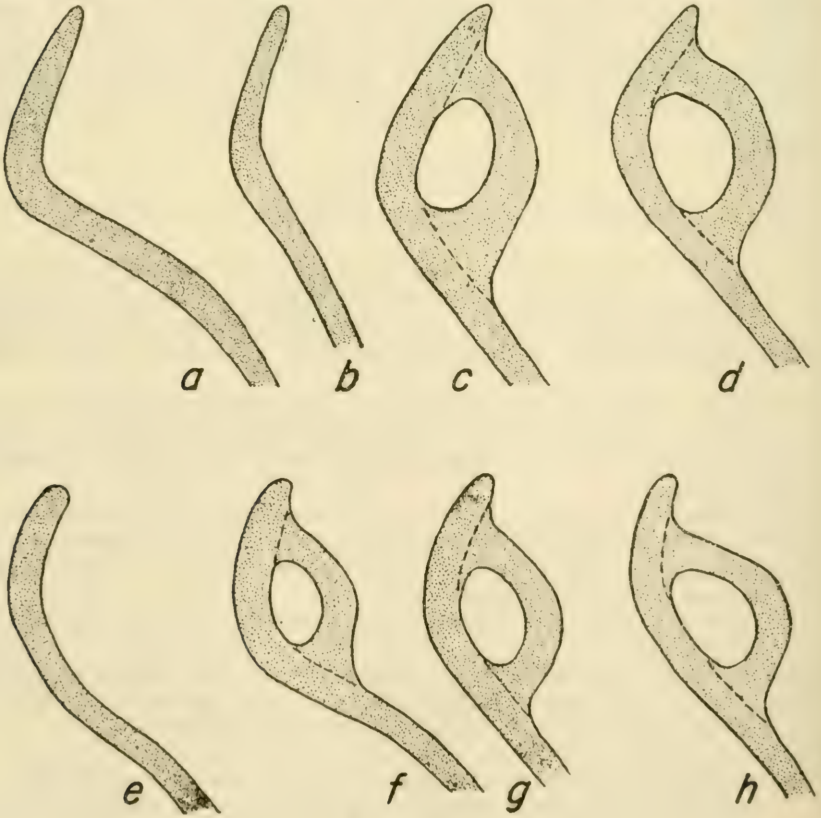

FIGURE 17.—Rim profiles, Fanning site.

cross section. (*b*) Straight-sided straps (34 specimens), in which width is fairly uniform except for the slight widening at points of attachment. These range in width from 15–40 mm. (fig. 18).

Loop handles, with circular or flattened elliptical cross section, occur twice. There are two lug handles—heavy protuberances, wider than they are long, and extending out from the body (?) or rim, imperforate, but with 2 or 3 deep vertical notches or indentations at their outer end. Thin horizontal tabs which are flattened extensions outward from the vessel lip also occur very

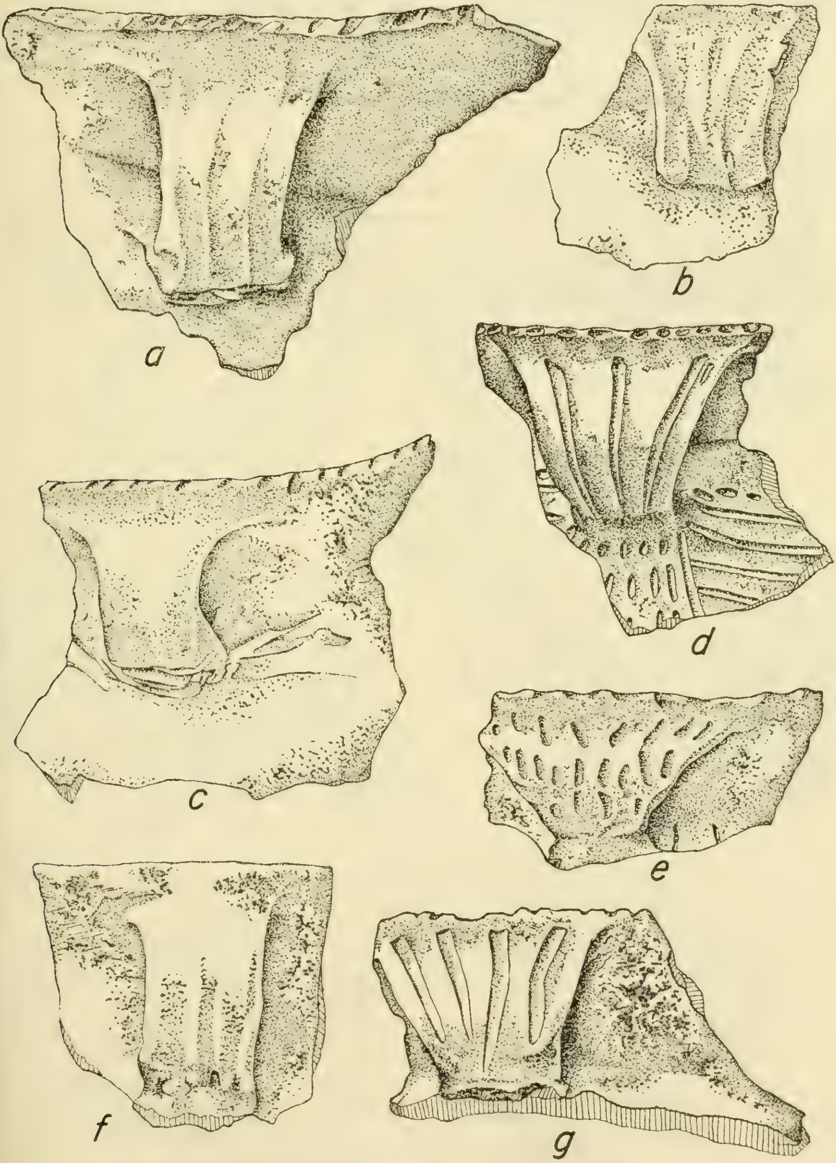

FIGURE 18.—Straight-sided (*a–c*, *f*) and tapered (*d*, *e*, *g*) strap handles, Fanning site.

sparingly, always imperforate and undecorated; they were probably confined to open bowls.

**DECORATION**: Confined entirely to the lips and handles. Approximately 70 percent of the strap handles have broad shallow flutings apparently made by drawing the fingers vertically down the surface; 20 percent have narrower scored, incised, or trailed lines made with a pointed instrument. Lip decoration consists of punctate or incised elements (20 percent), closely spaced along the lip surface and seldom very carefully executed; or of shallow impressions apparently made with the finger tip, occasionally with the nail mark also present (37 percent); or the lip was left undecorated (38 percent).

### *Fanning Trailed*

*(Sample: Body sherds 185; rimsherds 29; total 214)*

**PASTE**: See Fanning Plain.

**SURFACE FINISH**: See Fanning Plain.

**FORM**: See Fanning Plain. Most of the sherds bearing trailed or incised decoration suggest smaller vessels than do the plain sherds; one or two large vessels are also indicated, but even these seem to have been smaller and of lighter construction than a good many of the larger plainware vessels.

**HANDLES**: Present, including tapered strap (6), straight-sided strap (1), and loop handles (5); loop handles occur mainly on small vessels.

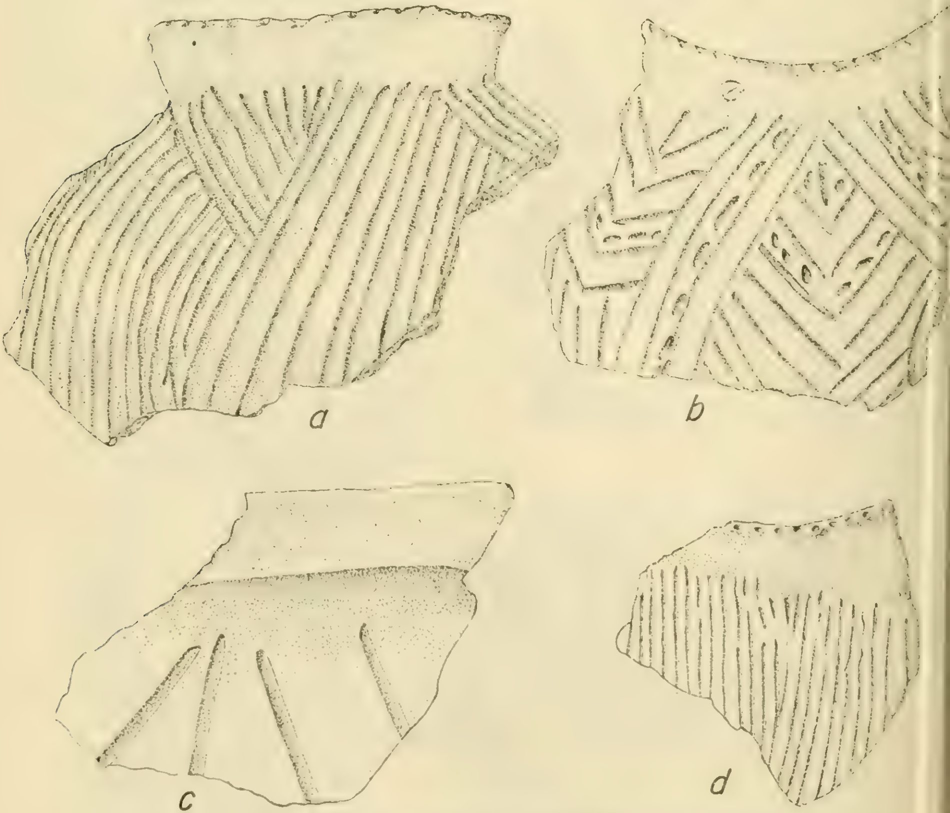

FIGURE 19.—Trailed potsherds from Fanning site.

**DECORATION:** Body decoration consists of broad (3–5 mm.) to narrow (0.5–1.5 mm.) trailed lines, usually running vertically to obliquely from the neck downward over the rounding shoulder (figs. 19, 20). In some cases, the lines are so

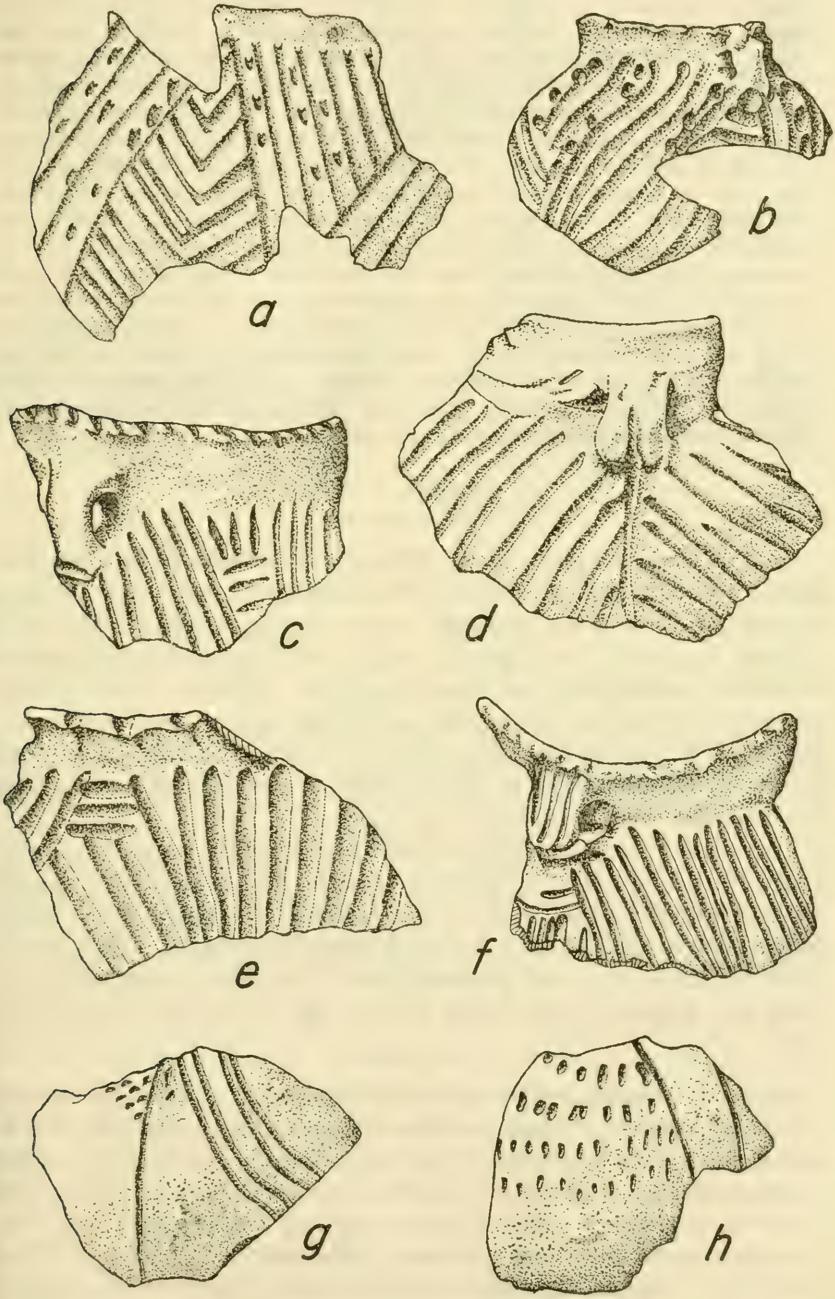

FIGURE 20.—Trailed and punctate potsherds, Fanning site.

narrow and deep as to suggest incising, and they may start with a deep sharp indentation; others are blunt ended, and some are faintly applied with little pressure. In some cases certainly, and perhaps characteristically, the lines occur in blocks of varying sizes and shapes, with the lines in adjacent blocks slanting in different directions (pls. 9, 10). The lines are nearly always closely spaced at intervals of 3–7 mm., but occasionally are as much as 20–30 mm. apart. In 26 sherds, short punctates, rounded to elongate, occur in a row between contiguous trailed lines (pls. 9, 10). Chevron arrangements also occur (pl. 9, *b*). In three instances, including the single restored vessel (pl. 8, *b*), blocks of punctates occur immediately below handles, and these blocks are flanked by trailed line areas. Curvilinear lines are present in two instances, but there are no circles. Lip decoration consists of finger (?) impressed units (21 percent) or of small punctations or diagonals (41 percent); there is considerable variation in the execution, but the best and most carefully done lip ornamentation from the site occurs on these rims. About 25 percent of the lips are undecorated. Handle ornamentation consists of vertical trailed lines (7 specimens), or of several rows of circular punctates or short indentations (4); only one specimen has the fluting characteristic of plainware handles. Where four handles occur on the same vessel, as on USNM 381751 (pl. 8, *b*), scored and punctate decoration alternates, with scored handles opposite each other and punctate handles opposite each other.

### *Miniature Vessels*

*(2 specimens)*

Both of these are incomplete. One is a fragment of small jar, full-bodied and with diameter apparently exceeding height, and having a constricted neck, a low recurved rim, and loop handles. The lip is notched, apparently with the finger tip; and body decoration consists of shallow trailed lines and round punctates. Measurements as reconstructed by projection of various curves were approximately 60 mm. in height by 77 mm. in maximum diameter. In practically all respects, this little vessel conforms to what has been described herein as Fanning Trailed ware (see fig. 20, *b*, and pl. 10, *b*).

The second piece is a shallow open bowl, slightly longer than wide, and with dimensions of 52 by 45 by 18 mm. At the ends and sides, the rim has been prolonged slightly into horizontal flat tabs, 4 in number. Below each of the end tabs there is a small perforation. That similar bowls of larger size were probably also in use here is suggested by a bowl rim fragment with a flat lip tab (pl. 10, *h*, and fig. 21, *d*, *e*).

### *Other Sherds*

Fourteen sherds, including 9 rim fragments and 5 body sherds, differ markedly in all respects from the foregoing materials. All are grit-tempered, in marked contrast to the locally made shell-tempered pottery; and the body pieces all bear simple stamping, done either with a scored paddle or with a thong-wrapped implement. The rims include 6 specimens with a thickened or braced rim (pl. 11, *a-f*). Four have parallel incised lines running horizontally along the rim exterior;

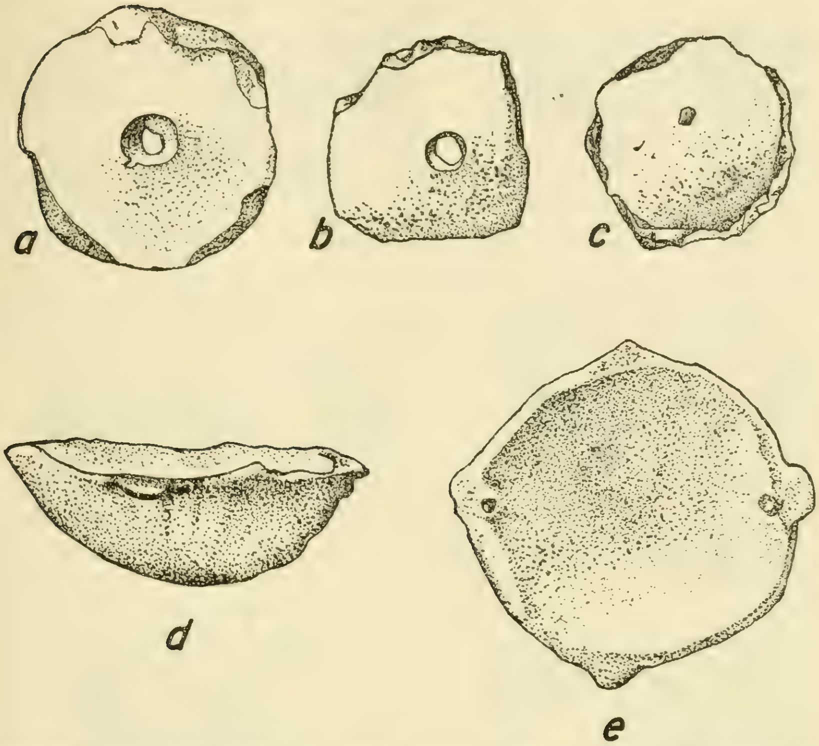

FIGURE 21.—Perforated disks (*a–c*) from reworked sherds and miniature pottery bowl, Fanning site.

one has parallel lines apparently crossed at intervals by paired slanted diagonals; and the sixth has herringbone indentations instead of the horizontal lines. Three, and possibly four, specimens are from vessels with multiple handles, and it may be presumed that these were from specimens with cloistered rims. The lips all have either diagonal incisions or punctates, the incisions being either on the top of the lip or else running downward on the inner upper margin of the rim. The three uncollared rims also show the diagonal incisions on the inner upper rim (fig. 22, *g*).

Eight of the nine rimsherds conform in paste, tempering, shape, and decorative treatment to pottery characteristic of Lower Loup sites in east-central Nebraska; and those with multiple handle scars are immediately recognizable to anyone with experience with the wares of that area and tradition (cf. pl. 11 with Dunlevy, 1936, pls. 2c, 3c and 3e, 6–8; Wedel, 1936, pl. 6; Wedel, 1938 c, pls. 4 and 5). Closely similar pieces occur in collections at the Nebraska State Historical Society from a number of sites in the Lower Loup and Platte valleys, including 25BU2 (Bellwood I), 25BU4 (Barcal), 25PT1 (Larsen), 25NC1 (Burkett), 25NC3 (Wright), and 25CX1

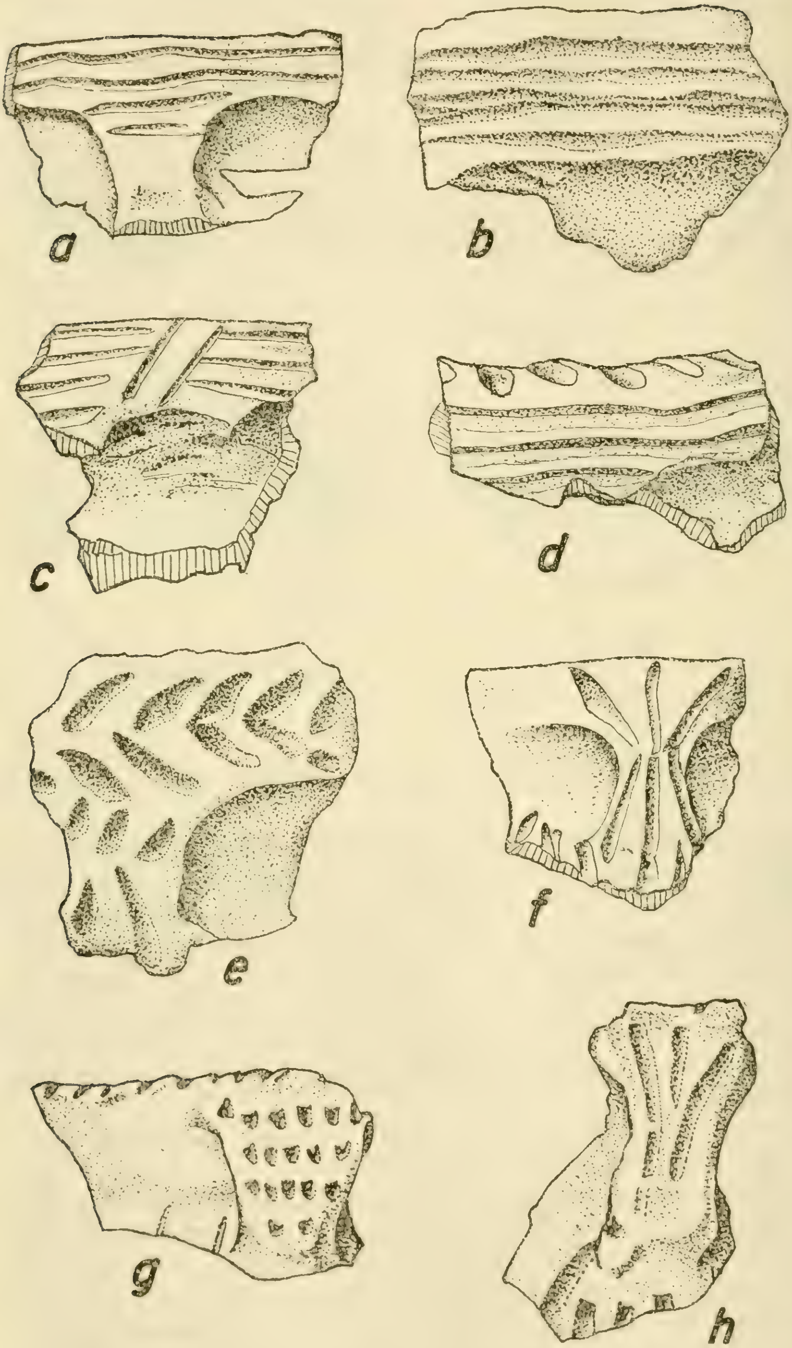

FIGURE 22.—Grit-tempered rim and handle sherds suggesting Lower Loup Focus connections, from Fanning site.

(Gray). The Fanning pieces are compact, hard, and well made—better, at any rate, than those from Lower Loup sites showing considerable White trade material, and about as well made as those from the earlier sites of the complex. We shall return to this point again.

Two other rimsherds, both shell-tempered, suggest a blending of Lower Loup practices with the local pottery tradition. Both show a decided thickening of the rim, and have deep diagonal incisions on the inner surface below the lip; on the outer rim below the lip, one has herringbone punctations, the other a single row of diagonal punctates. Except for the shell tempering, these pieces might well be considered Lower Loup trade items (pl. 11, *g*, *h*).

### PERFORATED POTTERY DISKS

Other than pottery vessels, the only ceramic products indicated in our work at Fanning consisted of perforated disks. There are 40 of these, all made from reworked potsherds; all but one were fashioned from plainware sherds. They are present in all stages—some are fairly well shaped, others are perforated but not otherwise worked, and a few show the first attempt at drilling. They seem to have been made by chipping sherds into a roughly circular form, perforating them centrally, and then grinding down the edges to produce a smoother outline. They range in diameter from 25–55 mm.; the perforation is always biconic, but varies from a well-smoothed hole to a very irregular one. In several instances, these disks occurred in some numbers in single cache pits. Thus, 5 were taken from pit 37, 4 from pit 3, and 2 each from pits 2, 20, 25, and 28. From pit 36 came 7 sherds, each with the central perforation, but otherwise without modification; none was circular, nor was there any evidence of an attempt to shape them. In one or two of these, the perforation lies near the edge of the sherd, and thus there is a possibility that these are remnants of broken jars repaired by crack lacing, evidence of which also occurred in several other plainware body sherds; but the fact that there were 7 such sherds together in one cache, and that there were other instances of clusters of perforated disks, suggests that the pit 36 materials were intended for the manufacture of disks also. The purpose for which these objects were intended is unknown (fig. 21, *a–c;* pl. 12, *o–q*).

### WORK IN CHIPPED STONE

The great majority of the chipped-stone artifacts from Fanning are made of a blue-gray chert, much of which has a characteristic banded appearance. Many of the objects, particularly among the numerous end scrapers, include on their nonworking surfaces more or less hard white calcareous material which was apparently the outside of nodular cherty concretions. I suspect that this material was obtained from some of the chert-bearing formations in the Flint Hills limestone beds of the lower Blue River drainage. There are also a few pieces of reddish-brown foraminiferous chert that may be Florence flint; but the present specimens lack the very characteristic banding found in the Florence flint artifacts collected at sites in the Arkansas River drainage of central and southern Kansas. No obsidian was found.

It appears likely that the blue-gray chert mentioned above was carried to the site in partially worked condition. Numerous unretouched spalls and flakes up to 10 or 12 cm. in length were found; and in pit 42 there was a compact mass of 63 such flakes, presumably stored away for future manufacture of implements. No nodules from which such flakes might have been struck came to light anywhere in our workings.

*Projectile points.*—Chipped points are represented by 41 whole and 7 fragmentary specimens. Of the former, 36 are of simple triangular unnotched shape, widest at the base, which is usually straight or very slightly concave, and with straight to slightly convex lateral edges; all save one or two are bifacially flaked. Workmanship and quality of flaking vary considerably. The size range is as follows: length 13–37 mm., mean 23.3 mm.; width 12–16 mm., mean 14.3 mm.; thickness 2–3.8 mm., mean 3.3 mm.; weight 0.5–1.0 gr., mean 0.85 gr. (pl. 12, *l*, *m*).

Three other points are roughly triangular but have curved edges, with their maximum width somewhat above the base. They are larger and of much cruder manufacture than the points in the foregoing group. Two were made from thin flakes and are retouched mainly along the lateral edges; the third is bifacially flaked, but retains the marked curvature and asymmetry of the original flake. They range in length from 34–38 mm., in width from 15–22 mm., and their mean weight is 2.75 gr.

The two remaining points are of altogether different type, and were probably not a part of the site complex. Both are thick stemmed and coarsely flaked, strongly reminiscent of the large corner-notched and other heavy stemmed Woodland point types found at Woodland and Hopewellian sites in this general region. The larger is corner-notched, measures 50 by 32 by 7.5 mm., and weighs 11.5 gr.; it was found in pit 10. The smaller, a surface find, is notched above the base and has an expanding stem; it measures 40 by 27 by 7.5 mm. and weighs 9 gr. I believe that both points are from a much older period of occupancy than that represented by the small triangular points which decidedly predominate on the site.

*Bipointed objects.*—There are four of these from the surface and two from the excavations in midden 1. They are fusiform, widest and thickest at the middle, and are bifacially chipped to a rather blunt point at each end (pl. 12, *k*). They range in length from 17–46 mm., in width from 7–10.5 mm.; the width to length ratio varies from 1:2.5 to 1:4. Their bifacial chipping distinguishes them from a group of somewhat similar objects found at the Leary site and described (Wedel, 1936, p. 49) as gravers. To what use these objects were put I cannot say; they may have been fish gorges (see fig. 24, *f*).

*Drill points.*—There are three of these, all from excavations. They are long, narrow, moderately thick objects, bifacially chipped to a point at one end. Length varies from 29–47 mm., width from 9–15 mm. In two the working tip is long and evenly tapered, the other end being either broken or else much less carefully flaked. The third has a short stubby point and a rounded dressed butt. The tip and adjacent lateral edges of the longest specimen appear to be somewhat blunted from use.

*Knives.*—Bifacially chipped objects with cutting edges to which the term knife may be reasonably applied are surprisingly uncommon in our collection from Fanning. There are, in fact, only four such specimens, all incomplete. Two are oblong with the long edges more or less parallel, and each has one end missing; they measure 60 by 41 by 11 mm. and 48 by 25 by 9 mm. The edges are irregular and uneven, and have only a moderately good retouch. One lateral edge of the larger appears to be somewhat blunted from wear. Another piece is evidently the tip of a pointed blade, showing two oppositely beveled lateral edges; whether this is from a four-edged diamond-shaped knife of the so-called Harahey type or from some implement with but two oppositely beveled edges and a rounded notched butt such as occur commonly in the Little River Focus sites in Rice County (p. 270) I am unable to say. The fourth specimen from Fanning is a roughly triangular thick flake with one curved, uneven, and coarsely chipped cutting edge; its size is 62 by 40 by 13 mm.

*End scrapers.*—These ubiquitous little implements were the most numerous of all the artifacts found at Fanning, with exception of the potsherds. They are a rather variable lot, but all share the unretouched plane under surface, a more or less steeply chipped broad working end, and a convex or ridged upper surface. Unlike the end scrapers characteristic of the Little River Focus sites in Rice County, however, the Fanning scrapers are seldom very well made and very few show much or careful retouching of the convex surface. They look like strictly utilitarian tools made to a well-established basic pattern, but without much effort devoted to fashioning fine implements (pl. 12, *h–j*).

The 129 complete end scrapers found may be divided into five groups:

Group I (38 specimens).—These are fashioned from spalls of varying size and shape, with the convex surface generally retaining much of the limestone matrix that originally enclosed the chert. All are of banded gray or blue-gray stone. The shape is largely accidental, the convex surface consisting usually of two or three longitudinal flake scars with little or no further modification of the lateral edges. The broader end is generally chipped to a rounded working edge. Nearly all specimens are asymmetrical, the highest part of the ridge being to one side or the other of the longitudinal midline of the specimen. Dimensions are: length 32–66 mm., mean 45 mm.; width 15–37 mm., mean 24.6 mm.; thickness 8–12 mm., mean 10.9 mm (fig. 23, *a*).

Group II (16 specimens).—These are very similar to the foregoing, except that they have fine retouching on one or both lateral edges and thus tend to have an ovate form. They are also somewhat shorter, narrower, and thinner. Dimensions: length 27–43 mm., mean 33.8 mm.; width 15–32 mm., mean 22.2 mm.; thickness 4–19 mm., mean 8.1 mm. (fig. 23, *b*)

Group III (6 specimens).—These are strongly ridged or keeled, with a single longitudinal flake scar on each side of the ridge. They are triangular in cross section—in effect, prismatic flakes with retouching only at the broad end. Dimensions: length 33–66 mm., mean 44.3 mm.; width 18–30 mm., mean 21.5 mm.; thickness 8–9 mm., mean 8.3 mm. (fig. 23, *c*).

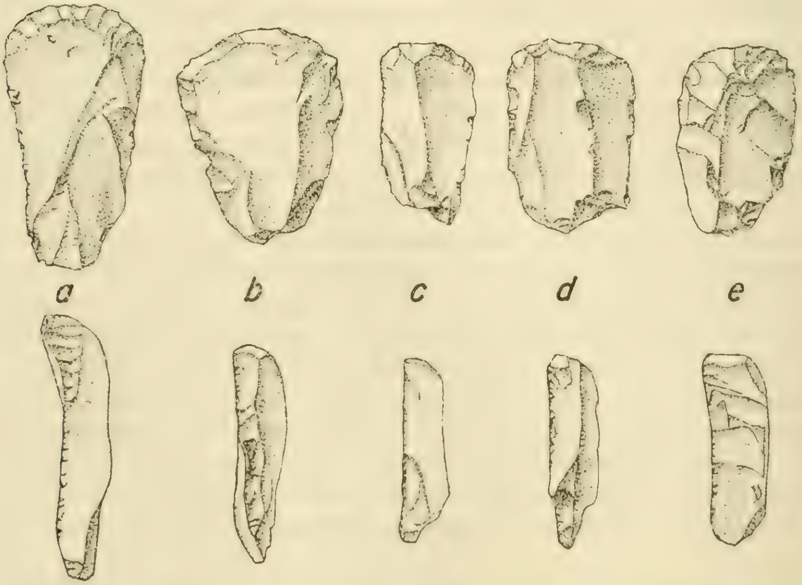

FIGURE 23.—Top and side views of chipped end scrapers, Fanning site.

Group IV (61 specimens).—Scrapers of this, the largest, group are relatively broad and low-backed, with the convex surface consisting of more than two flake scars and the lateral edges as well as the broad end retouched. Dimensions: length 23–60 mm., mean 36 mm.; width 15–35 mm., mean 24 mm.; thickness 4–14 mm., mean 7.7 mm. (fig. 23, *d*).

Group V (8 specimens).—These have a fairly prominent convex surface, usually rounded by the allover flaking by which the final form was achieved. In cross section, they lack the angular profile that characterizes most of the preceding scrapers; and they show generally more modification of the original flake than do any of the others. Dimensions: length 26–65 mm., mean 39.2 mm.; width 19–33 mm., mean 26 mm.; thickness 6–16 mm., mean 11.1 mm. (fig. 23, *e*).

*Side scrapers.*—These are unifacially chipped spalls of irregular and largely accidental form, many of which retain a thick white layer on one surface. Nearly all are made from Flint Hills (?) chert, generally the same material that was used in groups I and II of the end scrapers. They differ from the end scrapers in that the final retouch is all on one or both lateral edges, never at the end. The quality of retouch varies greatly; sometimes it is carefully done and provides an even curved cutting edge, whereas on other pieces it is irregular, coarse, and haphazard. All these specimens are planoconvex in cross section.

Two groups may be distinguished, viz, single edged and two edged. The former, represented by 28 specimens, includes spalls with little or no modification other than the edge retouching. The size range is as follows: length 35–68 mm., mean 53 mm.; width 16–52 mm., mean 28 mm. The second group consists of larger and somewhat more carefully finished implements, some with a strongly ridged back, and all with retouching on two lateral edges. The 15 specimens have the following size range: length 48–97 mm., mean 61.6 mm.; width 20–47 mm., mean 30 mm. (fig. 24, *a–e*).

*Flake knives.*—Distinguishable from the foregoing by their smaller and more slender character are seven prismatic flakes with very finely retouched edges. The edges are usually retouched or chipped from the plane surface as well as from the slightly ridged back. Size range: length 45–68 mm., mean 52.4 mm.; width 14–21 mm., mean 17.1 mm.; thickness 5–7 mm., mean 5.7 mm.

## WORK IN GROUND AND PECKED STONE

Materials used in manufacture of implements considered in this section include sandstone, catlinite, pumice, hematite, diorite, quartzite, and granite. The first of these was presumably obtained from the Dakota sandstone outcrops beyond the Blue River, 100 miles or

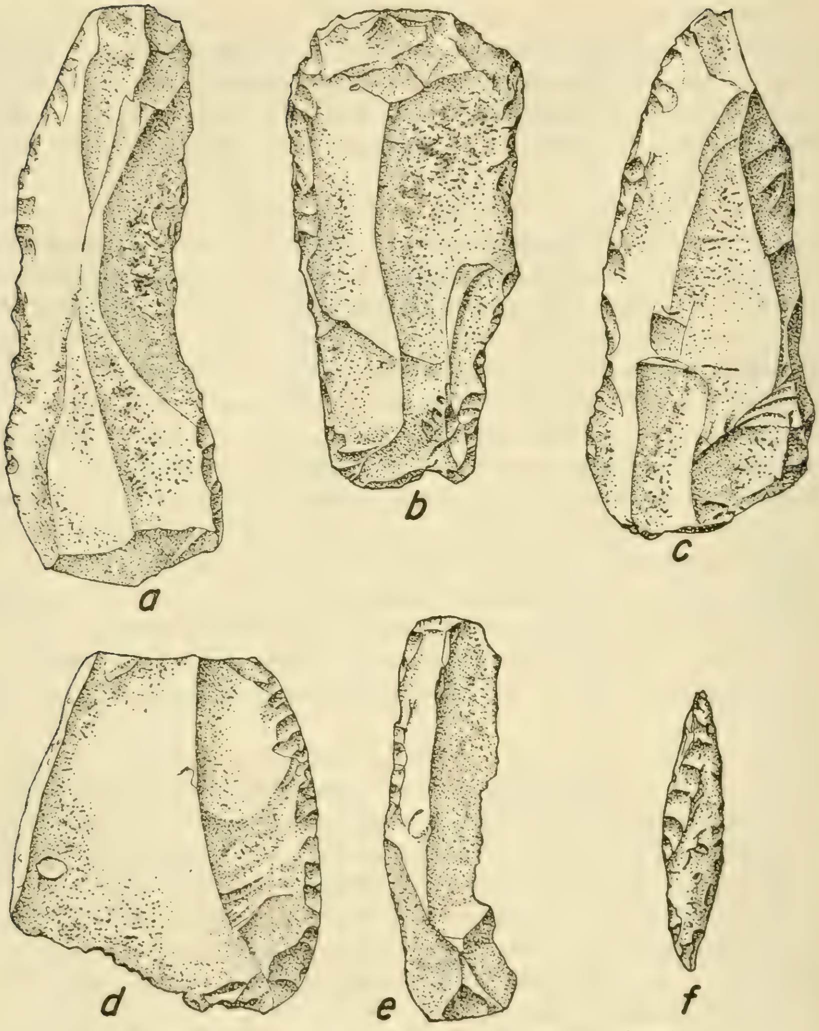

FIGURE 24.—Side scrapers and bipointed object, Fanning site.

more to the west. Pumice occurs as irregular slightly worked lumps that may have been gathered along the shore of the Missouri River, as it was by the historic Indians of the valley. The nearest natural occurrence of catlinite was the famous quarry in southwestern Minnesota, whence the stone may have reached the Fanning locality by intertribal trade. Hematite was obtainable in Missouri and southern Iowa, but the exact locality from which originated the pieces found at Fanning is uncertain. Diorite, Sioux quartzite, and granite were obtainable as boulders in the glacial drift of northeastern Kansas, and probably the materials of which our artifacts were made were taken at no great distance from the Fanning locality.

*Abraders.*—There are several kinds of abrading tools in our collections. Most common are six worked fragments of oblong shape, each with one or two flat surfaces bearing a shallow longitudinal groove such as would be produced in the smoothing of arrowshafts. The largest piece is 65 by 37 by 25 mm., and is broken at both ends. This piece, and two much smaller fragments, suggest some care in shaping, and I suspect they are from paired shaft-smoothers such as were found in both broken and unfinished state at the Leary site (Hill and Wedel, 1936, p. 45 and pl. 7, *a–c*) and which are also known from many other sites in the Central Plains. Other fragments at Fanning are perhaps from broken pieces modified by re-use until their original form is obscured.

Four oblong flattish pieces have one to several short deep narrow grooves on one or more surfaces or else bear short broad grinding facets. The narrow grooves suggest awl sharpening; the broader facets could have been produced in rounding off the ends of sticks, bone implements, or other materials, but not in finishing arrowshafts or similar long objects.

Three pieces of sandstone, including a shaped irregular block with dressed edges and measuring 87 by 55 by 18 mm., have smoothed surfaces that suggest their use as whetstones or rubbing tools. Two other blocks of very fine-grained red sandstone appear to have been roughly shaped; their surfaces bear smoothed areas, and one has also numerous narrow grooves not over 1.5 mm. wide and of equal depth (fig. 25). These two specimens measure 11 by 10 by 3 cm. and 12.5 by 6.8 by 3 cm. Still another smoothed block, of light-gray limestone and measuring 95 by 80 by 16 mm., has a single straight groove on one face.

Five lumps of pumice vary in size and shape, and were apparently not dressed to form. All show smoothed or worn facets that might have been produced from hide dressing or by rubbing of other soft materials. They range in size from 40 by 25 by 15 mm. up to 125 by 105 by 65 mm.

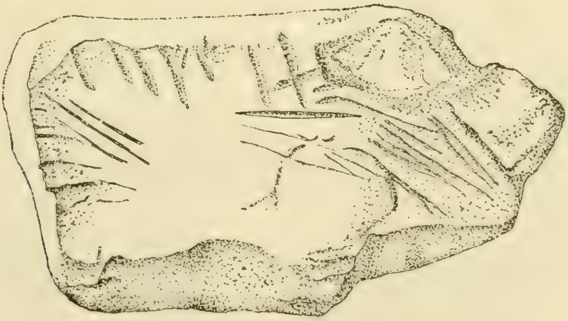

FIGURE 25.—Sandstone sharpening block, Fanning site.

*Celt.*—From the surface of the site came the only celt found. It is elliptical in cross section, widest at the blade edge, and tapers evenly toward the butt, which is broken. The surface is well smoothed, especially near the blade, but there are numerous pittings and irregularities on much of the surface. It measures 60 by 42 by 19 mm., and is of diorite.

*Pitted stones.*—There are two of these, each with a single pit, and both are of limestone. One appears to be the half of a nearly circular, thick block, with edges battered to shape; one face is unfinished, the other is smoothed and bears a small pit, bisected by the break. The pit is 20 mm. in diameter by 10 mm. deep; the block measures 98 by 64 by 45 mm. The second specimen is roughly quadrilateral, with the ends and lateral edges pecked to shape. One side is unfinished; the other is smoothed and has a shallow pit, 24 by 4 mm. The block measures 122 by 85 by 56 mm.

*Rubbing stones.*—Two stream-worn pebbles bear the marks of battering on their peripheries, and each has one smoothed face. The latter suggests that the specimens were used as rubbing or smoothing stones. Whether the pecked peripheries indicate some effort at shaping the objects, or are the result of use as pecking or hammerstones, I cannot say. The stones measure 88 by 78 by 35 mm. and 67 by 56 by 37 mm.

*Sinew stone* (?).—This is an irregularly shaped fragment from a flattened waterworn quartzite cobble. All surfaces exhibit some smoothing. Where the fractured edge meets the natural surface, there are four shallow grooves or notches, each 4–5 mm. wide, where some soft thin material or narrow object appears to have been drawn repeatedly across the edge. On another edge there appears a similar single notch, plus faint suggestions of several others. The piece measures 83 by 43 by 35 mm. (fig. 26).

*Milling stones.*—Flat slabs of tough stone used for grinding were found in three pits; and elsewhere in the excavations and on the surface were recovered handstones, or mullers, probably used with

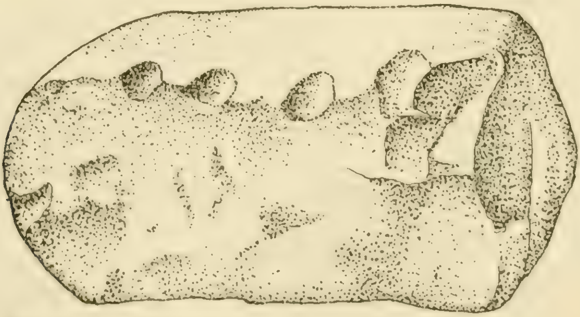

FIGURE 26.—Notched quartzite "sinew" stone, Fanning site.

such slabs. The largest slab, found in pit 43, is of granite; it measures 63.5 by 32.5 by 10 cm., and most of the perimeter shows evidence of dressing by pecking or battering. The working surface has a shallow, smoothed, elongate depression, evidently produced by a more or less rotary motion with the handstone. The two smaller slabs are of pink Sioux quartzite, and measure 23 by 12.7 by 5 cm. and 27 by 15 by 3.8 cm.; they were taken from pits 8 and 22, respectively. Both show evidence of shaping around the edges, and one surface of each is worn smooth, but not in the same manner as the large slab. I am inclined to think these also served in grinding, with the muller used in a back and forth motion over the entire surface of the slab. Alternatively, they might have been "anvil stones" used with a hammer for the crushing of cherries, berries, and other food substances; but I doubt that such usage would produce the sort of worn surface observed.

Three mullers, one of which is broken, were made of quartzite. Two appear to have been worn smooth from rubbing, the other is unsmoothed. The two complete specimens measure 16 by 10 by 5.2 cm. and 13 by 8 by 3 cm.; the third seems to have been originally a thicker specimen of substantially the same size and form. The complete specimens are from pit 34 and house test 1; the fragment was a surface find.

Dinsmore (1912, p. 54) lists "5 mano stones" among the surface collections he made on the Fanning site.

*Pounding stones.*—This term includes two specimens which give some indication of having been hafted and used for pounding or chopping. One is an irregular pillow-shaped block of limestone, 12 by 8 by 5 cm., with slightly constricted middle. At one place in this constricted zone is a short 15 mm. groove, polished from wear that might have come from the rubbing of a haft. There is no wear of this sort elsewhere on the piece, which is otherwise unfinished and unsmoothed, but there is some evidence of battering on the blunt end surfaces.

The second specimen is a quadrilateral slab of diorite, 12 by 8 by 2.5 cm., which has very shallow notches midway of each long edge. The faces are unfinished; one end is sharpened somewhat, the other is battered to a blunt surface, as from pounding. It suggests a crude chopping tool, probably hafted and used perhaps for the crushing of bones.

No trace of grooved mauls was found during our investigations, but there are reports of surface finds that suggest (Dinsmore, 1912, p. 53) that hammers of more definitive sort than the objects noted above may have belonged to the site complex. Dinsmore, for example, observes (Dinsmore, 1912, p. 53) that "I found one maul, weight 8¼ lbs. of red granite; one small beautiful round mallet, weight 8 oz." Since these were surface finds, it cannot be positively asserted that they were used by the Indians who dug the numerous cache pits and made the shell-tempered pottery. I have not seen Dinsmore's collection and can give no further details regarding the objects; but the larger suggests a grooved maul, the smaller possibly a war-club head.

*Catlinite objects.*—There are 7 pieces of worked catlinite, but no finished or complete artifacts. Three pieces are pipe fragments. Two are from the juncture of bowl and stem, but give no information as to the size and form of the original pipes. A third piece is apparently the end of a pipe stem; it has a small comb on the upper surface, which was perforated but has been mutilated by cutting. The exposed stem bore has a diameter of 10 to 11 mm., and shows horizontal grinding striae. None of these three pieces exceeds 25 mm. in maximum dimension.

A quadrilateral block measuring 63 by 63 by 14 mm. has most of one face ground smooth, as are the edges; the reverse is unworked. On the worked face, deep narrow grooves mark out what was evidently intended to be an elbow pipe blank. I am inclined to think that the block must have been accidently split after its initial dressing and marking but before the roughed out pipe could be detached, and so was discarded.

The remaining three pieces are presumably rejectage. Two show evidence of deep sawing at the edges, where they were finally detached by snapping them off; and there is also some smoothing of the surfaces. The third piece has three adjoining ground edges, and one broken and unsmoothed surface. I am unable to determine whether any of the cutting shown was done with metal tools, but am inclined to doubt this.

Dinsmore (1912, p. 54) reports "one small pipe" from the surface, but gives no further details concerning it.

*Hematite.*—Seventeen pieces of worked hematite came from various locations in the site. All are hard massive material giving a dark red-rown streak; they vary from 18 to 306 gm. in weight. All show rubbing facets, and on some the present surface appears to be almost entirely produced by prolonged rubbing or grinding. None has been intentionally shaped, although one has cutting grooves apparently designed to remove one corner. Undoubtedly all were used as sources of pigment.

### WORK IN BONE AND ANTLER

*Hoes.*—Scapula hoes are represented by 10 specimens; 7 of these retain most of the distal extremity, or head, 1 is split through the head, and 2 are large slivers off the anterior and posterior borders of the bone. They have been modified by partial to complete removal of the scapular spine and of the ridge at the posterior border, and by sharpening of the vertebral border. The head is either unmodified or else shows slight notching and working down of the edges of the glenoid cavity. On most, there is a high polish from use and the working end of the blade has been worn back to a deep broad V-shaped notch with smoothed edges. No effort seems to have been made to smooth down the scars left in removal of the spine and ridge, beyond eliminating the jagged edges. In one case, the spine appears to have been hacked away by repeated blows from a steel tool, perhaps an ax or more probably a heavy knife. In another, numerous fine light scratches and one or two deep narrow cuts run along each side of the spine, suggesting knife cuts intended to weaken the bone for removal of the spine by blows from the side.

Specimens sufficiently complete to indicate the length range from 29 to 39 cm. Six were fashioned from the left scapula, four from the right. All are bison.

*Knife or scraper.*—This is a segment of bison scapula with one edge thinned for cutting or scraping. The opposite edge is much heavier and consists of the worked down scar left in removal of the scapular spine; and this extends 30 mm. beyond the end of the blade. The surfaces are much eroded, but traces of wear are still visible. Including the projecting back, the specimen measures 145 mm. in length and it has a width of 73 mm. It may have been used in cutting or shredding soft materials, such as squash, or in scraping.

*Shaft straighteners.*—Four segments of worked and well-smoothed bison rib were evidently shaft straighteners. The longest measures 55 mm. and is cut off square at one end, very likely with a metal saw. The other end is broken through a hole 8 to 9 mm. in diameter, slightly elongate from wear in a direction parallel to the long axis of the bone. Seven deep narrow notches have been cut into one edge. Another piece, 45 mm. long, is broken at both ends through holes that also show their heaviest wear in a longitudinal axis. It has 11 fine notches along one edge, and the concave face of the bone bears numerous fine striae. A third piece is 80 mm. long, broken and slightly smoothed at one end; at the other, the break is through a heavily worn hole (pl. 12, *e*). The fourth specimen is apparently unfinished; it is an 18-cm. segment cut off square at both ends. About midway of its length a conical pit has been drilled into the concave face, which is otherwise heavily striated as if from scraping.

*Knife handle.*—A rib segment 12.3 cm. long is broken at one end and cut square at the other. Transversely across each face, 7 to 8 cm. from the broken end, is an incised line; between these lines and the broken end, one edge of the rib has been slotted and the cancellous tissue removed to a depth of 9 mm. The slot is approximately 1.5 mm.

wide, and so was presumably intended to accommodate a metal blade. The opposite edge has 15 shallow narrow notches; and the piece is generally well polished from use.

*Worked rib fragment.*—This piece, 47 mm. long, may have been part of a shaft straightener or knife handle. One end is very raggedly broken off, the other is cut rounding. Surfaces are well polished. Near one end, on the internal face, are three lightly incised transverse lines. From each end of this group, 3 similar lines run obliquely across the surface to converge or cross 25 mm. from the broken end. Beyond this point, the surface of the bone is broken away, and the lines cannot be traced further.

*Needle fragments.*—Here I include 4 specimens, 3 of them broken and 1 unfinished. Despite their incomplete nature, they seem to me to suggest the presence of implements perhaps not unlike the large mat-weaving needles described by Skinner (1921, p. 245 and fig. 17) for the Menomini. All were made from strips of split mammal rib, probably bison, dressed down so that only traces of the cancellous tissue are discernible on the convex surface of the needle, which was always curved.

Our longest specimen (USNM 381883) measures 193 mm. and is 9 mm. in maximum width; thickness nowhere exceeds 2 mm. It shows a long even taper to a well-finished heavily polished tip. The butt is broken off, so that neither the original length nor the presence or absence of an eye can be determined. A second piece (USNM 381814), broken at both ends, is 143 by 85 by 3.5 mm.; it shows a very slight taper toward one end and at the other has been broken off through an eye 2 mm. in diameter. Still another specimen measures 73 by 9 by 2.5 mm. and is also broken at both ends. One break is through a 3-mm. hole, whose remaining portion is heavily worn; a second hole has been crudely drilled 10 mm. from the break, but shows no wear (pl. 12, *d*). Surfaces are well polished from use.

What I take to be a needle blank is a 210-mm. sliver split from a large rib. One edge is formed by the natural rib border; the other is uneven, and follows a deep cut made after the rib was split. The width is irregular, but nowhere exceeds 11 mm., and the cancellous tissue has not been worked down nor is the tip finished. The object seems too light and thin for an awl or punch; but its proportions and size would yield a finished tool not much different from the needles inferred from the fragments noted above.

*Awls.*—Awls are very poorly represented in our collections. The single complete example is split from mammal leg bone, probably deer metapodial. The head is partly worked down, and is from the proximal extremity. The specimen has a long even taper, and is highly polished (pl. 12, *c*). Its length is 13.5 cm. A second specimen is the rounded butt of what appears to be a "rib-edge" awl; it is well smoothed, slightly flattened in cross section, and shows very faint traces of cancellous tissue on the convex surface. Length is 67 mm.

The distal end of a deer metatarsal, 50 mm. long, has been deeply grooved transversely across the shaft and snapped off raggedly. The anterior and posterior surfaces above the condyles bear deep longitudinal scorings, and there are ends of at least four other such scorings. These marks suggest that this is the discarded end of a bone grooved for splitting preparatory to the manufacture of awls.

*Tubes.*—There are two of these, one broken and one apparently unfinished. The first (USNM 381708) is a 65-mm. length of bird bone, split, and broken at one end. The other end has been cut neatly and smoothed off. The entire piece is highly polished. The second specimen is of thick-walled mammal leg bone, and measures 37 by 14 mm. The ends have been irregularly cut off, but are unsmoothed.

*Worked penis bone.*—The well-polished os phallus of a raccoon has had the anterior extremity cut off but is otherwise unmodified and has no perforation. Its length is 98 mm.

*Projectile points of deer antler.*—Five of these interesting objects came to light in our excavations. Each is the neatly dressed tip of a deer antler, carefully fashioned by whittling and grinding into a symmetrical conical form, with polished point and socketed base. Basal diameters range from 10 to 13 mm., with sockets up to 17 mm. deep. Length varies from 48 to 63 mm.; and the longest specimen has, additionally, a thin basal tang 7 mm. wide by 19 mm. long (pl. 12, *g*). Four of these points were taken from pit 1, the fifth from pit 42.

From pit 37 came a 59-mm. section of antler lacking the extreme tip. A narrow groove encircles the piece 30 mm. below the broken tip end; below this groove, the antler has been split or whittled off at one side so that the cancellous tissue is exposed. Apparently, this represents an attempt to obtain a projectile point blank with lateral tang. There is no polish and the piece was never finished.

There is also a short thick tapered section 33 mm. long, cut from near the end of a deer tine, with battered tip. It may have been the beginning of a projectile point shorter and heavier than any of the finished specimens. Two antler fragments, 9 and 11 cm. long, each with clean-cut distal extremity, probably are scrap from manufacture of points.

*Hammer of antler.*—This was fashioned from the basal portion of a large deer antler, with the brow tine attached. The tine forms the handle; the remaining portion of the main shaft, with the "burr" battered or chopped away, is the striking head. The specimen, 20.5 cm. in length, shows little use polish, but is of a very convenient size and shape for use as a hammer or small mallet. It turned up in the refuse bone from the site, and its exact provenience is uncertain.

### METAL AND GLASS OBJECTS

Iron, brass, and glass objects of European origin were found at a number of points in our excavations. They were not abundant, and they included none of the larger items, such as hoes, gun parts, traps, and axes, that would be expected if the natives had been in direct and regular contact with an established trading system. That the Indians at the Fanning site had relationships with white men seems a reasonable conclusion; but I believe it is equally reasonable to regard these relationships as more tenuous and infrequent than would be expected to be the case after the establishment of trading posts above the Kansas River on the Missouri in the mid-18th century.

Iron is represented by 13 pieces, some very small and all very heavily oxidized; and this, plus their generally fragmentary nature, makes identification of the original articles impossible in most cases. From house test 2 came a short knife blade (USNM 381837) measuring approximately 55 by 19 mm., with an 11 by 17 mm. tang for insertion in the handle. Another smaller fragment (USNM 381945) from pit 42 is perhaps another knife blade. From pit 11 was taken an incomplete thin disk 55 mm. in diameter with a 5-mm. central perforation. Other pieces are unidentifiable; one or two from shallow findspots are perhaps late intrusions, but the majority were inclusive in the aboriginal deposits (pl. 13, *b*, *c*).

Brass objects were in general much better preserved. Seven small scraps are probably rejectage. A thin concave disk 40 mm. in diameter has a central opening 17 mm. across, bordered by 3 concentric ridges (pl. 13, *i*). Two coils of light wire, one with 3 turns, the other with 4, and with overall diameters of 18 mm., were found in pits 18 and 42 (pl. 13, *h*). Thirteen crudely twisted cones range in length from 21 to 65 mm.; each has a small opening at the apex for passage of the thong or cord by which they were attached to garments or other items (pl. 13, *d–f*). Two twisted and crushed tubes, the larger 43 mm. long, were presumably also for stringing; they were apparently made by turning up the edges of rectangular sheets and overlapping them. Hawkbells include a mangled specimen originally about 16 mm. in diameter (pl. 13, *g*) with 2 encircling lines, 2 holes in the lower half, and strap loop fastened by soldering; a slightly larger example with 2 pairs of encircling lines and with the strap loop fastened by inserting into the body and then bending the ends over; and half of a third specimen without recognizable markings or other distinctive features. There is also a strip of brass 35 mm. wide, which tapers toward a broken tip and has a broad tang at the other end, suggesting a knife blade; total length is 156 mm., and the convex edge is smoothed. From pit 17 came 5 small circlets made by bending brass strips 2 to 3 mm. wide by 10 to 11 mm. long into a circle; one still contains a bit of dark organic substance that may be leather (pl. 13, *j*). Classed as annular beads when found, these are identical to objects found closely spaced on thong fragments from a burial at Doniphan (p. 126) and to others described as "fringe clips" from Arikara burials near Mobridge, S. Dak. (Wedel, 1955, p. 159).

Two blue glass beads, both badly weathered, are listed in the catalog of Fanning materials; but unfortunately these have been misplaced and no further description can be given. One is from pit 22, the other from pit 23. My field notes state that "a pea-sized blue glass bead" was found in the west corner center posthole in house 1. A "tubular shell bead . . . trade ware" is listed from pit 31, and 2 from the surface; but these also have not been found.

### SUMMARY AND CORRELATIONS

Our investigations at the Fanning site confirm earlier observations regarding the presence here of important archeological remains, and, by extending our knowledge of their nature, they permit more precise correlations with other sites than have been possible heretofore. A number of points are still illuminated poorly or not at all, and some of these will probably remain so for some time; but progress has certainly been made, and the general position of the materials in the picture of eastern Plains prehistory is measurably clearer.

The Fanning site, as indicated by low refuse mounds and abundant trash-filled cache pits, marks the location of a semisedentary Indian community of moderate size. Neither the number and density of former house units nor their usual nature were disclosed by our work. The single structure indicated by a definite posthole pattern and bits of burned grass-impressed clay was presumably an earth-covered dwelling with four center posts, like those of the protohistoric Pawnee. That other similar units once stood here, their traces now wholly obliterated by long cultivation, is possible; but it is equally likely, I suspect, that the more usual habitation was a surface structure with bark or mat covering, all evidence of which vanished with early plowing of the site. There is no indication whatever that the community, which probably did not much exceed two or three hundred people, was in any way fortified.

Subsistence was based in part on cultivation of maize, of which there is direct evidence. Use of beans and squash is inferential. The bison scapula hoe is the only horticultural tool found, and the gardens were probably in the valley bottoms at a little distance from the village. Wild fruit, nuts, berries, and tubers were undoubtedly used in season; and there is direct evidence that the groundnut (*Apios americana*) was harvested and strung for storage. The presence of numerous cache pits suggests surpluses to be cared for and drawn on during the nongrowing season. Hunting was of considerable importance, with deer and other woodland forms taken in greater abundance than the bison. Birds were used to lesser degree; of fishing, there is no evidence, unless certain bipointed chipped flints are correctly identified as fish gorges.

The inferred subsistence economy and the probable nature of the community pattern indicate that the natives here were participating in a way of life widespread throughout the eastern Plains in very late prehistoric and early protohistoric times. In the absence of fortifications and in their probably prevalent use of a house type other than the earth lodge, the Indians at Fanning differed from their Pawnee contemporaries on the Lower Loup. In these respects, as also in the nature of their material culture inventory, there are much closer ties with the Leary site on the Nemaha River, some 15 miles to the northwest. These similarities, especially prominent in the pottery complex, extend to other categories as well; and they serve to place the Fanning site, as Leary has been (Hill and Wedel, 1936), in the Oneota Aspect. The Oneota Aspect is considered in more detail elsewhere in this paper; but some remarks regarding the relationships between the Fanning and Leary sites are relevant here.

The pottery complex, well represented at both sites, may be noted first. At Fanning, as at Leary, 95 percent or more of the pottery is shell-tempered. The single restored jar from Fanning suggests the same basic vessel shape indicated by the longer series at Leary but there is no evidence of elliptical or horizontally elongate vessels from the former. Fanning site rims include more high straight forms than those from Leary. Trailed, incised, and punctate body decoration occurs at both sites; and this includes the characteristic use on shoulder and upperbody of blocks of parallel lines alternating either with other blocks in which the lines slant in a different direction, or with areas of punctates. Especially characteristic at Fanning is the use of a single vertical row of shallow punctates flanked on each side by zones of parallel trailed lines. At Fanning, the decoration is usually less skillfully done and occurs on only about 15 percent of body sherds as compared with nearly 33 percent at Leary. The circle and the cross, both of which occur at Leary, are absent at Fanning. Lip decoration, by diagonal incisions, punctates, and finger impressions, is found on 60 to 70 percent of Fanning rims and on more than 90 percent at Leary; but the deeply notched or crenate lip so common at Leary is rare at Fanning, as is the use of punctate elements on the inner upper surface of the rim. Handles are common in both, but occur more plentifully, in much more variety, and in greater elaboration at Leary. There are no "crested" or "tailed" handles from Fanning. Fanning pottery includes relatively more heavy strap handles, these often widening markedly toward the top, commonly with shallow fluting, and probably associated with a larger proportion of high heavy rims from large utility vessels. At Fanning, about 90 percent of handles were attached at their upper end below the lip, whereas at Leary some 65 percent were attached at the lip. There are no vertically bisected vessels, or sawed sherds at Fanning. As this recital of the major differences suggests, the pottery complexes at Fanning and Leary are by no means identical; and of the two, that at Leary seems technically much the better and artistically the more advanced and unrestrained. At the same time, it should be emphasized (1) that the two are sufficiently similar to be readily distinguishable from any other pottery tradition of the trans-Missouri Plains, and (2) that in those details in which they are dissimilar, each shares its apparent peculiarities with other more distant Oneota manifestations.

With respect to nonpottery traits, close comparison is rather unsatisfactory because our excavations at Fanning produced a generally more limited series of artifacts than is available from Leary. Common to both, if sometimes in variable proportions, are the following: decided prevalence of small triangular unnotched chipped projectile points; abundance of end scrapers; unbeveled knives probably predominant over beveled, but neither abundant; flake knives; plain-shafted straight drills, not common; bipointed chipped objects (fish gorges?); grinding stones (mostly small to medium at Leary with rotary grinding motion or pounding indicated, some evidence of to-and-fro grinding on larger slabs at Fanning); grooved mauls (crude at Leary, reported as surface finds from Fanning); ground diorite celts with elliptic cross section; paired sandstone shaft smoothers; sandstone sharpening blocks; pumice abraders; catlinite for pipes (disk pipes at Leary, pipe fragments only at Fanning); hematite with scraped and worn facets; hammerstones; bison scapula hoes; bone awls scarce, apparently usually of split mammal leg bone (?); bison rib arrow straighteners or wrenches; polished bone tubes; needles (eyed forms from Leary, large flat mat-weaving (?) type from Fanning); and conical socketed antler tip projectile points, sometimes with basal tang at Fanning.

The above list includes a very substantial majority of the artifact materials from the two sites. A few artifact categories from Leary are not reported from Fanning. These include incised tablets and disk pipes of stone; a chisellike object and a cylindrical section of antler, the latter with dressed ends; and an ulna pick. The edge-slotted bone knife handle from Fanning, on the other hand, is not duplicated from the Leary site; nor are there materials clearly of white origin from the latter. I suspect that if we knew more about what was collected at Fanning in prior years and what may still remain unfound, the similarities between the two sites might well be yet closer.

There are, of course, other Oneota manifestations in the trans-Missouri region of which some note must be taken here. These include abundant and important materials in Saline County, Mo. (Chapman, 1946), the Stanton site in Stanton County, Nebr., and Occupation B at the Ashland site, Saunders County, Nebr. (Hill and Cooper, 1938, pp. 267–271).[17] Detailed comparisons of these with Fanning cannot be attempted here; but it may be noted that Stanton and the Missouri materials seem generally rather more like Leary than like Fanning. This applies to both pottery and nonpottery traits. In certain minor details, as in presence of many high straight vessel rims and in extreme scarcity of punctate or other decorative elements on the inner upper rim, Stanton more closely resembles Fanning. In general, I have the impression that Fanning exhibits a somewhat simpler and less artistic pottery complex than Stanton, Leary, and the Missouri Oneota sites, and lacks as well some of the more distinctive nonceramic traits there represented, such as disk pipes and inscribed catlinite tablets. It is worth noting, too, that White contact materials are associated with the Oneota complex at Stanton and in Missouri, as at Fanning; but they were not found at Ashland.

The general chronological position of the Fanning site is not difficult to establish. As adequate evidence indicates (Mott, 1938), the Oneota Aspect is a relatively late manifestation throughout most of its area of occurrence. It includes sites with, and others without, White contact materials. At Fanning, the discovery of small quantities of iron, brass, and glass beads in some 17 of 46 refuse-filled cache pits, confirms a post-European contact dating. Beyond this, the problem is not so simple. None of our finds can be exactly dated. They include, as already indicated, no gun parts, traps, axes, or other heavy goods. Knife blades are present, but otherwise only small ornaments and trinkets seem to be indicated. Such items, I suspect, could as well have come from the packs of itinerant traders or trappers as from visits to an established trading post. The first such post in the general region was Fort Orleans, founded by Bourgmond near present Malta Bend, Mo., in 1723 and abandoned a few years later. At this time, however, the only fixed Indian village of which we have record along the Missouri in present northeastern Kansas was that at Doniphan. The meager evidence we found at Doniphan, where White contacts were also indicated, faintly suggests possible contacts or relationships with an Upper Mississippi manifestation; but it disclosed no site comparable to Fanning or Leary. I believe that the Fanning site was already abandoned by 1724; and I suspect it may also have preceded the year 1700. In this case, its White contact materials doubtless came from some of the traders or trappers who were venturing in small parties up the Missouri and its tributaries by the closing decades of the 17th century.

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[17] Griffin (1937 b, p. 297) long ago suggested the "probability" that certain late ceramic and associated materials in the Ozark region of northwestern Arkansas and southwestern Missouri (Harrington's 'Top-Layer' culture) would "eventually be classified in the Oneota aspect of the Upper Mississippi phase." No detailed description of these remains as a whole has yet been published; but two statements (Dellinger and Dickinson, 1942; Bell and Baerreis, 1951, p. 71) are relevant. From these, it appears that there are certainly affinities with Upper Mississippi, and also that there is inadequate basis for further assignment to the Oneota Aspect as this is known from Iowa, Wisconsin, Minnesota, Nebraska, Kansas, and Missouri.

Additional evidence in support of this general placement derives from the association at Fanning of local potterywares with several gravel-tempered collared and cloistered rim sherds clearly assignable to the Lower Loup Focus of east-central Nebraska. Unfortunately, these exotic sherds do not permit precise dating, since the age of the several Nebraska sites from one or more of which they may have come is not definitely fixed. In other words, they indicate contemporaneity but not the exact time of that contemporaneity.

As to tribal identity of the people to whom the Fanning site should be attributed, nothing conclusive can be offered here. That the Oneota materials in general represent the remains of the Chiwere Siouans, and may also have entered strongly into the material culture complex of the Dhegiha, is generally accepted by midwestern workers. Specific tribal correlations for the known trans-Missouri sites in Kansas and Nebraska, however, remain unproved. The lateness of the Fanning site, if my pre-1700 guess date approximates reality, and occurrence there of White contact materials, would seem to narrow considerably the range of tribal possibilities. Documentary evidence indicates that the Kansa had a considerable settlement in 1724 at present Doniphan; and the Marquette map of 1673 suggests that the tribe was already in the general region by that time. Perhaps if we had fuller data regarding the nature of Kansa material culture at Doniphan, our problem would be somewhat easier. Lacking such a tieup, it still appears likely that the Fanning site was the location of the Kansa as of roughly the time of Marquette or perhaps a little later.

Identification of the Fanning site as Kansa is not without its difficulties. The Kansa were closely related to the Osage; and Osage archeological materials of the late 17th and early 18th centuries with which comparisons should be made are not available. The Osage assemblage from Vernon County, Mo. (Chapman, 1946) shows a number of similarities to Fanning, though probably no more than do the Saline County materials attributed to the Missouri tribe; but the Vernon County remains are evidently of a later period than those at Fanning. What degree of similarity there may be if and when Osage sites contemporary with Fanning are studied, I do not venture to predict. It is, therefore, with some reservations that I concur with the suggestion made some 40 years ago by Sterns [18] that the Kansa were probably responsible for the Fanning site.

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[18] Unpublished manuscript, "The archeology of eastern Nebraska . . .," vol. 2, p. 176 (Peabody Museum, Harvard University).

## HILLTOP BURIAL SITES

Along the ridges west of the lower Wolf Creek valley are a number of small inconspicuous burial "mounds." Most of these appear as very slight elevations on the ridge summit; rocks of various sizes, some of them burnt, are usually scattered about on the surface over an area 5 to 8 yards across. Cultivation has probably reduced considerably their original height and subdued their contours, but I know no description of their appearance before the land was broken. For information on the location of these remains I am indebted to Fenn Ward, rural mail carrier at Highland, who had tested one or two of the "mounds" and subsequently guided us to several of them. Mr. Ward was also instrumental in securing permission for us to excavate.

### RAS MATHERSON SITE

Two mounds on the Ras Matherson farm, circa 2 miles west of Sparks and 400 to 500 yards south of United States Highway 36, were selected for test. Situated on a commanding ridge, with no convenient site for a village within several hundred yards, the two were about 100 yards apart. The northernmost of the two was examined first. Two trenches, each 3 feet wide and 32 feet long, were dug so as to intersect at a right angle at what appeared to be the mound center. At the outer end of each trench clean yellow-brown clayey subsoil was found 12 to 14 inches below ground surface. As the point of intersection was approached, bits of brick-red burnt earth appeared in increasing numbers, extending a few inches below the plowed zone. Large irregular chunks of the same material lay under and just east of the center stake. This burnt earth and occasional bits of scorched bone, were the only evidence that the ground had ever been disturbed by man.

About 30 inches east of our center stake, a layer of stone slabs was uncovered (pl. 14, *d*). It measured 58 by 30 inches, the long axis running north to south, and was designated burial 1. Five feet to the northwest was a similar but smaller slab mass; and small stones were scattered here and there to a distance of perhaps 6 feet southward from the two slab areas. Removal of the stones from the larger group disclosed an elliptical pit 51 by 27 inches with a total depth from the surface of about 20 inches. The pit fill was dark in color with some admixture of charcoal, contrasting markedly with the clean, lighter-colored unmixed soil of the walls. The fill was worked over meticulously, yielding but two or three very small bits of human bone. Under the second rock mass were the somewhat more plentiful but equally fragmentary remains of another burial; the bones, including numerous skull fragments, covered an area about 21 by 24 inches across, and all were within 10 inches of the surface. Many of the fragments were fire blackened. There were no artifacts in association, nor could a pit outline be found. This was designated burial 2.

Beginning at a point about 6 feet south of our center stake, we next proceeded to excavate all moved dirt to whatever depth and distance were indicated by burnt earth, charcoal, or other admixture. This resulted in the delineation of a basin 24 inches deep at the center, with steeply sloped curving walls, a north-south diameter of nearly 11 feet, and an east-west diameter of 9½ feet. Except on the east side, where the grave pit of burial 1 partly intersected the basin, there was no break in the wall outline. The basin fill contained much fire-reddened earth, particularly at and near the center, but there was no trace of ash. Mixed through the fill were bits of human bone, some of them fire blackened; the entire basin yielded somewhat less than a cigarboxful of this scrappy material. There were no artifacts, and practically no stones. So far as we could tell, there had been no disturbance of the mound or its contents other than some superficial results of plowing.

About 5 feet north of the above basin lay a smaller but deeper one. Measuring 95 inches north to south by 38 inches wide by 36 inches deep, this contained only dark moved earth without artifacts or traces of bone. Its purpose is not known.

From our findings, I would surmise that the large shallow basin was dug for no other purpose than burial, and that into it were thrown the fragmentary remains of bodies that had been cremated somewhere nearby. Over the nearly filled basin were placed stones, perhaps by way of discouraging disinterment of the remains by wild animals. If the rather ambiguous statements of some of the older residents are credible, there was also some mounding up of earth over the burials. The smaller stone-covered areas which we designated burials 1 and 2 may have been laid down at a different time. Burial 2 was certainly later than the main basin, but the well-defined pit noted as burial 1, wherein was found no fire-reddened earth, could have been an earlier feature. The general similarity, however, in the fragmentary skeletal remains, the stone coverings, and complete absence of artifacts rather suggests that all the burials were probably left by the same people. It is possible, too, that the smaller bone-free basin north of the large one was dug for further burials, but for some reason was never so used. There is, of course, no way of estimating the number of individuals represented in the various basins and grave pits, or of determining their one-time cultural affiliations.

The second mound had been dug into a year or two prior to our work, by Mr. Ward and others. As our tests progressed, it became evident that nearly all of the burial area had been worked over. Bone fragments, some of them with fresh breaks, were encountered in small quantities; and the presence of a few boulders suggested a setup probably paralleling that we found in the other mound. The only undisturbed find worthy of note was a very badly broken skull, dissociated from any long bones, stones, or other remains. No basin outline could be determined; and, as in the other mound, there were no artifacts.

### A. W. GUTHRIE SITE

About 3½ miles north of the Matherson mounds, and a mile or slightly more south of Iowa Point, we opened another slab-covered grave on the Paul Guthrie farm. The grave was situated on a high point about 400 yards north of Cotter Branch of Indian Creek (pl. 14, *a*) and within a few hundred yards of the Missouri River bluff. From the burial point, a narrow descending ridge projects southward toward the creek, which carried some water at the time of our visit. Potsherds, projectile points, and other artifacts, apparently representing more than one cultural horizon, have been picked up on the Guthrie farm, where a stone-chambered burial mound was also opened long ago (Wedel, 1943, p. 160). We found three grit-tempered cord-roughened sherds on the slope below the burial site. Unhappily, we were unable to make a thorough search of the tract, and so I can make no statement as to probable nearby village sites.

The grave under consideration had been exposed in plowing a year or two before our arrival, and stones of various sizes were scattered about. We cleared away 4 to 5 inches of loosened topsoil, exposing a layer of fine-grained gray sandstone slabs covering an area about 5 feet across (pl. 14, *b*). Included were slabs as much as 27 inches long by 18 inches wide, whence they ranged downward to mere pebbles; none exceeded 2 or 3 inches in thickness. Their source is uncertain but they seem to have ben carried in from somewhere down the slope several hundred yards away.

Below the slabs was a subcircular pit slightly over 5 feet in diameter; the sides were steeply sloped, and the maximum depth was about 30 inches. On the southeast and northeast sides, about 10 inches above the main pit bottom, was a shelf or bench about 18 inches wide. On this bench 10 inches below the largest slab, was a skull fragment; other scraps of human bone were scattered about through the fill in the deeper part of the pit. There was no evidence of burning on the bones or in the soil, nor were there any artifacts. It is possible that these bones were the remains of a body previously exposed on a scaffold, and already subjected to weathering and disintegration before interment. It is wholly impossible to determine the cultural horizon to which the burial should be assigned, or its age (pl. 14, *c*).

Our rather inconclusive findings on the Matherson and Guthrie farms appear to be in line with those of local enthusiasts. We were told that artifacts are generally absent, that the skeletal remains are almost always very fragmentary and scattered, and that the human bones frequently show scorching. That the remains in the Matherson mounds are from cremated bodies seems a reasonable inference, in view of the evidence of scorching and of long-continued burning of some of the soil in the fill. At the Guthrie place, on the other hand, no burning was indicated, but the fragmentary nature of the bones may be taken as evidence of secondary interment here also. In neither case, unfortunately, is it possible to relate the burials to any of the several archeological horizons that are evidently present in this section of the State.

Surface collections owned by Mr. Guthrie included glass beads and other objects of historic age; grit-tempered plain and cord-roughened sherds, including rims with slight collars whose lower border was scalloped or noded, all probably assignable to a local Nebraska Culture manifestation; and several grooved axes, ground celts, a stemmed scraper, and a large grit-tempered mica-flecked sherd with rocker-roughening, all reminiscent of Hopewell remains in the vicinity of Kansas City (Wedel, 1943).

### MISCELLANEOUS SURFACE FINDS IN NORTHEASTERN KANSAS

As is clear from the foregoing pages, our limited excavations in 1937 along the Missouri and lower Kansas Rivers furnished evidence of the former existence in this part of the State of a variety of semisedentary ceramic complexes. Others undoubtedly await discovery and definition. There is, furthermore, clear indication of still older preceramic horizons here as well. None of our fieldwork was concerned with such materials, but we were told of occasional finds of projectile points and other artifacts differing widely from those usually acquired by local collectors. Through the courtesy of Fenn Ward, of Highland, Kans., I am able to illustrate (pl. 15, *a–j*) and report briefly a series of points that give interesting indication of the nature of some of these early remains. All of those figured are surface finds in and near Doniphan County, and are without direct cultural association.

The five specimens shown in the upper row (pl. 15, *a–e*) are only generally suggestive of possible early materials. Their shapes and certain other characteristics set them off from the specimens usually identified in and about the Central Plains with Woodland and later ceramic manifestations. Thinning of the base is indicated in *a* and *e*, but only in the latter can it be said to approach actual fluting. On all five specimens, the lateral edges have been blunted by grinding for a distance of 10 to 13 mm. above the basal corners; in *e*, this blunting extends from 23 to 33 mm. up the edges. I have not observed this feature on any of the points excavated by us in Kansas sites of the ceramic complexes.

Early point types are more strongly suggested by the central block of specimens illustrated, notably in *f* to *j*. The largest of these, *f*, is of mottled gray and tan chert, measures 9.9 by 2.7 by 0.55 cm., and is fluted on both faces. Secondary chipping along the edges is coarse and irregular; the indented base and the lateral edges for some 35–38 mm. above the corners are ground smooth. It is a good example of the Eastern Fluted type, whose geological context and age remain undetermined. Typical Folsom points are represented by *h* and *i*, the former lacking the base. Both are broadly fluted on each face to within 5 to 10 mm. of the tip; and the edges show fine even chipping with flake scars measuring 1 to 1.5 mm. each in width. Much less well made, but falling within the range of Folsom points, is *j*; the fluting is poorly done, but the lateral edges adjacent to the base have been blunted. Still another early form, the Plainview point, is suggested by *g*, in which the lateral edges are blunted for about a third of their length above the base, beyond which the edges converge to the tip. There is a suggestion of a medial ridge on one face. This specimen recalls the somewhat narrower basal fragment of a Plainview-like point reported by Solecki (1953 a, fig. 2) from site 14MH33 in Tuttle Creek Reservoir, though the base is more nearly straight in the present piece.

Since these specimens, as noted, are all surface finds without associations, they must be regarded for the present as suggestive rather than as definitive evidence of preceramic peoples. Their recurrent discovery at various locations, and the variations in type, nevertheless hint at the presence of early big-game hunters in this section of Kansas perhaps as much as 8 or 10 millennia ago. What is needed now, of course, is a discovery of fluted and other early point types in situ, with geologic and paleontologic contexts that will permit their placement in time and with artifact associations from which can be determined the local complex to which they belong. The glaciated northeast section of Kansas in which these pieces were found would seem a likely area for eventually discovering such associations.

## SITES NEAR MANHATTAN, IN RILEY AND POTTAWATOMIE COUNTIES

Manhattan lies on the north bank of Kansas River, approximately 120 miles above its mouth and just above the point where it receives the Big Blue River from the north. The Kansas and Big Blue, both perennial, flow in attractive flat-floored valleys from 1 to 3 miles wide, bordered by limestone-rimmed bluffs up to 200 feet or more in height. Both valleys, though occasionally swept by devastating floods, have fine terraces that are normally flood-free. Beyond the bluffs are, or formerly were, rolling tall-grass prairies intersected by small creeks, which, becoming perennial in their lower courses, at intervals of a few miles break into the main valleys from both sides. Practically all these creeks, like the main streams, were formerly well-timbered, as some of them still are, with a variety of hardwoods. Some juniper occurs on the steep north-facing slopes of the valleys. Until the 19th century, it may be supposed that the wooded valleys and nearby grassy uplands provided an abundant and varied fauna that could be easily and conveniently drawn upon by the Indians dwelling on the valley terraces; and the fertile bottom lands plus an average annual precipitation in excess of 31 inches made possible a relatively sure and productive horticulture. An added attraction was the chert exposed in limestone ledges along the creek valleys, especially south of Kansas River, this doubtless furnishing the gray to blue-gray stone used extensively in manufacture of chipped implements. All in all, it is difficult to visualize a locality better suited to aboriginal occupancies, whether these depended primarily on hunting and gathering, on the cultivation of crops, or on a combination of these practices.

That an abundance and variety of archeological remains once existed in this locality has been known for many years, thanks to the reports of Brower (1898, 1899) and others noted in another section of the present paper. These remains included village and campsites, frequently with ceramic materials; burial mounds of varied construction and content; workshop areas littered with great quantities of chipped chert implements; and, according to Brower, aboriginal chert quarries for which he presents no direct evidence of ancient workings. Unfortunately, most of these early-day investigations were made by individuals with little or no scientific training, and the literature pertaining to them is sadly lacking in the detailed information necessary for establishing associations and defining complexes. Much further investigation on a continuing basis will thus have to be made in order to define clearly the various native manifestations that are evidently present, to establish their sequence, and to fit them into the larger picture of regional prehistory.

Our primary interest in the Manhattan locality was the examination of the site of the Kansa Indian village of circa 1800–1830, reported just below the mouth of Big Blue River by Say and other contemporary observers, and a preliminary survey of some of the other sites noted by Brower and others. Our stay was a short one of less than 3 weeks; but it produced ample confirmation of what was hinted in Brower's reports, namely, that the locality was peopled by Indians at several different time periods and that sites are plentiful. Mounds were formerly present on the bluffs, and some of these were probably of some antiquity, though the records are vague, incomplete, and indeed often nonexistent; and these relatively conspicuous features, of course, have suffered a good deal more from curious amateurs than have the more obscure village and campsites.

### THE GRIFFING SITE (14RY21), IN RILEY COUNTY

Just above Manhattan, Kansas River is joined from the north by Wildcat Creek. Heading in the uplands of central Riley County, near the little town of Riley, Wildcat Creek runs southeasterly for some 20 or 25 miles to its union with the Kansas. It has a pleasant little valley with a gentle grade, and through this valley runs the line of the Chicago, Rock Island, and Pacific Railroad. We attempted no survey of the valley as a whole, nor did we examine two other sites reported by Brower (1899, p. vi)—one upstream, the other downstream, from the Griffing site. Casual inspection suggested, however, that the lower portion of the valley especially, from approximately Keats downstream, must have had much to offer a native semisedentary population. On both banks of the creek lie attractive terraces that are normally flood-free and widen as one descends the valley; the creek carries a good flow of water; and the hardwoods growing along its banks and on the steep south bluffs provided in aboriginal times an adequate supply of building timbers, fuel, and cover for game.

The Griffing site is located about a mile west of the Manhattan city limits, and 1½ miles above the point where Wildcat Creek issues from the bluffs to cross the Kansas River floodplain. Owing to unsatisfactory ground conditions, we were not able to define the exact limits of the site; but the surface evidences noted suggested that the maximum occupancy was on the terrace that the Rock Island railroad crosses to the north side of the valley (fig. 27). This is substantially the area sketch-mapped by Brower (1898, p. 24). The terrace here is about half a mile wide, and lies at approximately 1,050 to 1,061 feet above mean sea level.[19] Areas shown as under 1,050 feet, usually separated from the terrace proper by a scarp 10 to 12 feet high, are apparently subject to frequent overflow and constitute a floodplain; they include old cutoffs of Wildcat Creek, now partially filled in and under cultivation, but not usually utilized for residence in aboriginal times. The creek pursues a sinuous course down the valley in a channel some 20 feet below the terrace surface. South of the creek steep wooded bluffs, their summits utilized for erection of burial cairns by the Indians, overlook the site; northward, the valley wall rises more gradually.

According to Brower, 19 slight elevations which he took to be lodge sites were visible here in 1897. He reported that the site had been "very thoroughly explored" by W. J. Griffing; but there is no

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[19] Elevations given here and in figure 27 are approximate. They are based on an assumed elevation of 1,060 feet, m. s. l., for the Chicago, Rock Island, and Pacific Railroad bridge (No. 1464C) crossing Wildcat Creek near the east end of the archeological zone here included in the Griffing site.

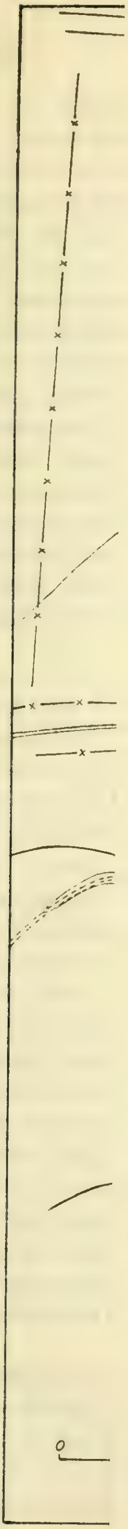

FIGURE 27.—
on an a

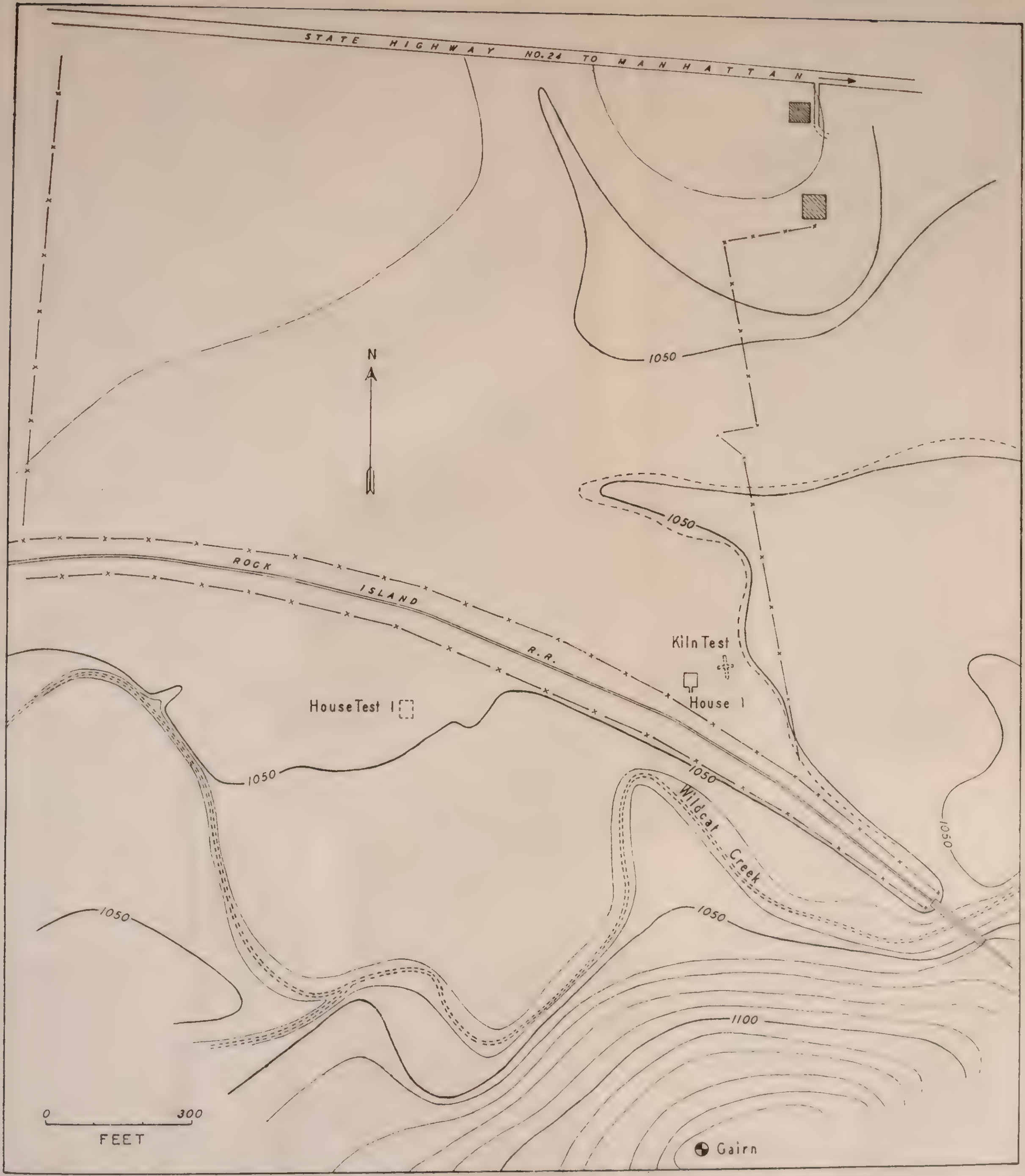
STATE HIGHWAY NO. 24 TO MANHATTAN
N
1050
1050
ROCK ISLAND R.R.
Kiln Test
House 1
House Test 1
1050
1050
Wildcat Creek
1050
1050
1050
1100
0
300
FEET
Gairn

FIGURE 27.—Map of portion of Griffing site, 14RY21, showing features investigated by U.S. National Museum, 1937. Elevations shown are based on an assumed elevation of 1,060 feet, m.s.l., for the Chicago, Rock Island & Pacific Railroad bridge No. 1464 C shown at lower right.

way of determining what these and other early-day investigations may have involved in terms of actual excavation. Brower's map shows three lodge sites east and north of the railroad bridge, including one on the south bank. The others were scattered loosely up the valley for more than half a mile; most of these were on the wider north terrace, but four are indicated on the south side of the creek. Of these elevations, owing to long-continued cultivation, little or nothing remained at time of our work; but the probable location of some could still be approximated by surface concentrations of potsherds, flints, and burned house daub bearing grass and twig impressions.

These indications, it seemed to us, were most promising at spots that appeared to coincide with two lodge sites shown by Brower on either side of the railroad north and northwest of the bridge, and also at approximately the point where he locates a "prehistoric kiln" at the bank of an old westward loop of the creek (cf. Brower, 1898, p. 24, and my fig. 27 and pl. 16, *b*).

### HOUSE TEST 1

Our first excavation unit, designated house test 1, was about 70 yards south and west of the railroad and 380 yards west by north of the bridge, at the edge of the terrace overlooking the creek bottoms to the south (see fig. 27). Here the plowed surface was littered with bits of burned grass-impressed clay daub, charcoal, potsherds, and other occupational debris. We stripped an area about 25 by 40 feet to a depth of 16 inches. Burned clay and charcoal continued below the plow-disturbed zone, and in this fill occurred also cord-roughened sherds, worked hematite, and flints. At 16 inches, the mixed fill gave way to clean undisturbed soil. Despite careful peeling of the floor of our excavation where this soil change took place, there was not the slightest trace of a fireplace or of a definable living level, and only the most unsatisfactory evidence of any postholes. In the southeast part of the cleared area we found a cache pit; and from this were taken a large milling slab, a smaller slab bearing nine pits or "cups" on one surface, portions of a medium-sized pottery vessel, much burned daub, and flint chips. The conviction persists that we were working in a house site; but the total absence of definable items such as hearth and postholes precludes any statement as to its size and the arrangement of features in it.

### HOUSE 1

Better success rewarded our efforts on the east side of the railroad right-of-way. Here, on a narrowing strip of terrace between the railroad and an old channel of the creek (see fig. 27), and some 200 yards east of house test 1, we trenched an elevation rising a few inches above the terrace surface. Burned clay daub, charcoal, and sherds were fairly plentiful to a depth of about 14 inches, where the mixture changed abruptly to a clean unmixed soil. Beneath the highest point of the elevation, at a depth of 18 inches, was a well-marked fireplace—a shallow basin of fire-reddened earth, 24 inches in diameter, containing a little wood ash. Working out on the probable floor level in all directions from the hearth, we next located 4 large postholes at a radius of 11 to 12 feet. These varied in diameter from 15 to 18 inches and in depth from 21 to 24 inches. All contained a mixed fill and charcoal; in one, at approximately the original floor level, vestiges of the post remained as a 13-inch ring of charcoal with the grain of the wood running vertically. Beyond these 4 holes were 43 smaller postholes, averaging 6 to 7½ inches in diameter by 6 to 14 inches deep. These were spaced at irregular intervals of a few inches to nearly 5 feet; some of the longer gaps may indicate that we missed one or more postholes. This series formed an approximate square with rounding corners (fig. 28), and with a gap on the south marking the doorway. On the south side also were two large postholes, one on either side of the doorway and about midway between the door and the southeast and southwest corners of the house. These were 12 inches in diameter; the one on the east was 18 inches deep, that on the west was 21 inches deep (pl. 16, *c*).

Except at the south side, the mixed fill ended a few inches outside the square of small postholes, suggesting that the shallow pit over which the lodge had been erected had measured approximately 32 by 34 feet, with the long axis north to south. On the south, a strip of refuse-laden fill 5 feet wide continued for some 12 feet to the end of the entrance passage. The passage was further defined by 2 rows of postholes, 4 on the east and 5 on the west, these being closely comparable in size and depth to the outer series in the house site.

Beneath the floor, and in all likelihood directly associated with the house, were five cache pits. The limited material taken from these did not differ significantly from that found in the house fill and on the floor. The three larger pits were located in or near the southeast, northeast, and northwest corners; two smaller ones lay west and southwest of the hearth. There was also a small pocket cache near the middle of the east wall. All these features are shown on the house floor plan (fig. 28); but through some strange oversight I neglected to place the pit numbers on the field map and so cannot now identify these features specifically. The sizes of the pits were as follows:

| | *Diameter (inches)* | | |
|---|---|---|---|
| Pit. No.: | *Top* | *Bottom* | *Depth (inches)* |
| 1 | 36 | 36 | 16 |
| 2 | 34 | 36 | 33 |
| 3 | 24 | 36 | 12 |
| 4 | 12 | 18 | 14 |
| 5 | 36 | 38 | 32 |

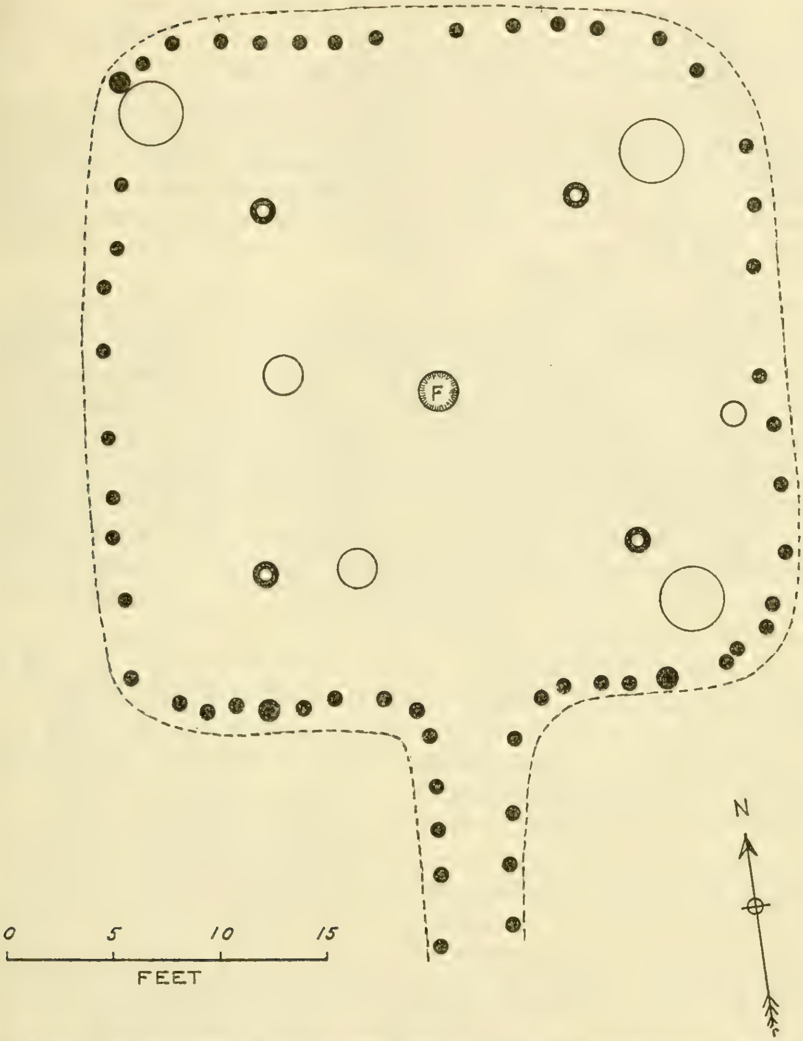

FIGURE 28.—Plan of house 1, Griffing site (14RY21). Solid circles indicate outer postholes; heavy circles, primary (center) postholes; rayed circle, fireplace; unnumbered circles, cache pits; broken line, approximate edge of house floor.

### OTHER EXCAVATIONS

A few yards east of house 1, on the terrace edge overlooking an old bend of the creek, was another concentration of burned clay, charcoal, and potsherds. Cultivation had spread this debris down the bank onto the partially filled creek bed. Tests at the upper margin disclosed some refuse below plowsole over an area about 35 feet across. This is, without much doubt, the location of Brower's "prehistoric kiln." We trenched this thoroughly; but the relative thinness of detritus below 6 to 8 inches depth offered little inducement to extended excavation. There was no trace of floor lines, hearth, or other recognizable house features, and we finally abandoned the spot. Of his investigations here, Brower (1898, p. 29) wrote:

> . . . The narrow walls of a small oven made of clay plastered against a foundation of straw and reeds, were obliterated by the weight of an accumulation of debris, and many pieces of burned clay were scattered over the surface of the plowed ground. From what appeared to be the floor of the kiln we recovered several large potsherds, one piece being about the third part of a whole earthen vessel, which has been . . . shown in Plate VII. A piece of the clay wall of the kiln is illustrated in Plate VIII.

The fragment of "kiln wall" illustrated by Brower is evidently grass-impressed clay and suggests to me that he was actually working in a house site or in house site debris; the "oven" was perhaps a cache pit. Brower's work here may have contributed to the obscuring or obliteration of other evidence which would have enabled us to identify the spot as a house ruin; or it is possible he was digging in a midden area associated with our house 1 and developed over an exterior cache pit. In any case, the restored pot he illustrated is without much doubt the same potteryware we found in our various excavations on the site; and so, whatever the true identity of his "kiln," it undoubtedly pertains to the same complex suggested by our findings at the Griffing site.

We made tests at several other detrital areas within the site as Brower delineated it. One of these was north and west of house test 1, just south of the railroad, and again near one of the lodge sites shown on his map. The subsurface evidences were considered insufficient to justify large-scale excavation. Farther up the valley, several small terrace remnants south of the creek and one larger refuse-bearing tract subject to inundation were also examined, but these were either judged unpromising or were not available for extended excavation. Neither did we devote any time to a cairn on the point of the bluffs overlooking the east end of the village site, since it had evidently been rifled long ago. I have little doubt that additional house sites could be located along this section of Wildcat Creek, if thorough search were made for them at various seasons; and while some may have been gutted or badly damaged by local collectors in, before, and since Brower's time, there are probably others that might still repay systematic excavation. Since we were able to define but one house site and our artifact sample is small and incomplete, additional data that could be gotten through further exploration would be well worth while.

### ARTIFACTS

The artifact yield from our excavations at the Griffing site was surprisingly small, even granting the limited extent of our work. Pottery remains totaled less than 300 sherds, including both surface and subsurface specimens. Stonework, including chipped and ground pieces, numbered less than 30 specimens. We found no objects of bone or shell, and virtually no refuse or scrap in either of these categories. Possibly local soil conditions, drainage, or other factors would account in part for the general lack of such organic materials; but one wonders whether much of the refuse was removed from the houses and discarded elsewhere—perhaps over the creek banks or in middens at a little distance from the dwellings.

### POTTERY

Ceramic materials recovered by us from this site consist of 62 rimsherds and 225 body sherds; no whole or satisfactorily restorable vessels were found. The great bulk of this came from house 1 and house test 1, and from the excavated pits within these features. Surface finds include 2 rim and 14 body sherds. There is a good deal of sameness among all these specimens, but sufficient differences seem to exist between the rim fragments to suggest that between 40 and 50 vessels are probably represented. All may be assigned to a single ware, here named Riley Cord-roughened, whose description follows (see pl. 17).

#### *Riley Cord-roughened*

**PASTE:**

*Tempering:* Rounded siliceous (sand) particles, 0.5–3.0 mm. diam., sparingly to abundantly used, and often protruding from the surfaces; some sherds include also angular particles of indurated clay (or crushed potsherds?) varying in color from light gray to nearly black, and having the same hardness and texture as the sherd body; a few sherds possibly from a single pot have shell inclusions, and shell is suggested also by a few "hole-tempered" fragments.

*Texture:* Fine, even, usually fairly well-compacted; fractures rough and uneven, but not crumbly; occasional tendency for sherds to split along their midline on a plane parallel to the surfaces.

*Hardness:* Varies between 3 and 4.5, most sherds apparently just under 4.

*Color:* Sherd cores are nearly all slate gray, rarely almost black, but sometimes light brown or tan; surfaces usually gray but in many cases with an orange-brown color; firing clouds.

*Method of manufacture:* Undetermined, no evidence of coiling in this sample.

*Surface finish:* Exterior surfaces almost invariably cord-roughened; individual impressions are 2–4 mm. apart, and may be vertically applied or else crisscrossed at various angles; interior surfaces smoothed, but often unevenly, and sometimes striated. A noteworthy characteristic is the disintegration and scaling away of surfaces, especially the exterior, so that the tempering particles protrude from a chalky-textured gray or brown matrix and impart a coarse sandpaper "feel" to the touch (cf. Hill and Cooper, 1937, pp. 232, 259).

**FORM:**

*Vessel shapes:* No whole or restorable examples found; larger sherds and partially restored segments suggest small to medium vessels, full-bodied, round in horizontal cross section, with rounded shoulder, constricted neck, and presumably a rounded base; miniature pots of same general form indicated; no recognizable bowl or other shapes.

*Size:* Restored segments suggest vessels up to 25–30 cm. in maximum body diameter.

*Thickness:* Sherd thickness ranges from 3.5–15.0 mm.; of 50 random sherds measured, 2 (4 percent) were under 4 mm., 40 (80 percent) were 4–8 mm., 8 (16 percent) were over 8 mm., and the mean was 6.2 mm.

*Handles:* One small plain strap handle from miniature pot present; probable handle scars noted on other sherds.

*Rims:* Two general forms are indicated. (*a*) Most common is a simple unthickened rim which rises from the neck and flares outward in a gradual curve to a rounded, or less commonly flattened or narrowed lip. The degree of curvature varies considerably; and in the larger, i. e., higher, examples, the rim is nearly straight, but in no case is it vertical or, with one exception, incurving. These rims are 8–40 mm. high, but mostly under 25 mm. They number 46 of 62 specimens, or 76 percent. (*b*) The second form (16 specimens, or 24 percent) consists of rims which have a thickening below the lip so that the profile shows a collar overhanging the neck. The collar varies from very weak to moderately pronounced, but it is usually much less prominent than in Upper Republican pottery of the Lost Creek and Medicine Creek localities of Nebraska. Two of three of these rims have a pronounced flare; others are nearly vertical; and in 2 or 3, the curve is inward so that the lip diameter apparently did not exceed the neck diameter. Rim height here varies from 16–35 mm., but is usually between 25 and 30 mm. Rounded or thinned lips are characteristic.

DECORATION: Occurs very rarely. One body sherd has deeply scored lines suggesting concentric upward-pointing chevrons or triangles; a low recurved rim has an incised zigzag line on the lip, shallow indentations or scallops on the outer lip edge, and 3 parallel incised lines which presumably encircled the vessel below the neck; a surface rimsherd has remnants of incised lines apparently oppositely slanted in adjacent blocks. The simple rims are usually undecorated, but 3 have the outer lip edge scalloped by notching with the fingers. Collared rims have either cord-wrapped paddle impressions on their outer surface (8), incised parallel horizontal lines (1), or scalloped or notched lower edge (3).

Although our pottery sample from the Griffing site is admittedly a small one, I feel sure that the potteryware named and described above will be found to recur with only minor variations over a considerable area in the drainage of the Kansas and lower Smoky Hill Rivers. Sherds readily classifiable as Riley Cord-roughened are apparently a characteristic ware of the Manhattan locality. They were found at practically all pottery-bearing sites seen by members of our 1937 party on the Kansas and lower Big Blue Rivers, as well as on the numerous creeks—Lyons, Clark, Humboldt, McDowell, Deep, and Mill, with their branches—joining the Kansas from the south. Local collectors and informants maintained that all pottery found in this locality was the same type; and such collections as we examined seemed to support this assertion. As we shall see presently, other and distinct potterywares do occur here, however, but in lesser abundance and on fewer known sites. It should be noted, further, that a good many of the sites and local collections characterized by Riley Cord-roughened sherds also have lumps of grass-impressed house daub, suggesting a direct association such as we established at Griffing site between this ware and earth-covered dwellings, the latter probably typically of square or rectangular form. The wider relationships of Riley Cord-roughened pottery and its associations will be discussed elsewhere; but it may be noted here that it has close resemblances to pottery from Minneapolis on the Solomon River (Wedel, 1935, p. 225), and probably to cord-roughened pottery from Salina, from Chase County, and elsewhere in east-central Kansas.

### WORK IN CHIPPED STONE

Most of the chipped stone artifacts were fashioned from the gray chert native to the locality. They include projectile points, knives, celts, and scrapers. Relatively few specimens can be said to have been well made.

Projectile points, four in number, include two triangular unnotched specimens from house 1 and two side-notched fragments from house test 1. The first two have slightly convex bases, convex blade edges, and are moderately well fashioned; they measure 37 by 15 by 3.5 mm. and 24 by 13 by 5 mm. A third specimen from house 1, 35 by 17 by 5 mm. in size, is possibly also of this type; but the tip has been intentionally rounded off so that there would have been poor penetrating power. The notched specimens include one small thin flake, retouched only along the edges and base, and provided with broad shallow notches just above the base; and a fragment of a small well-made point broken off at the notches. Doubtful projectile points include a fragment of triangular form 26 mm. across the base, with tip missing; and another thick piece with rounded base and edges, measuring 27 by 17 by 7 mm.

Knives include 4 specimens, all from house 1. They are more or less elliptical to leaf-shaped, with one or more of the longer edges retouched from both faces. The ends are usually rounded; one is squared. They range in length from 53 to 69 mm., in width from 26 to 37 mm., and in thickness from 6 to 17 mm.

Two celts were found in house 1. They are thick heavy pieces, with broad rounded blade and tapering to a narrow rounded butt. Maximum width occurs about one-third the distance up from the blade. Both show wear, with the edge of the shorter specimen blunted from use. They measure 140 by 55 by 23 and 127 by 57 by 32 mm. They resemble in all particulars one of the forms of heavy chert implements found formerly in great abundance on the surface of many sites in the Manhattan locality; and their inclusive presence in a habitation site, plus the indubitable evidence of use, suggests at least one prehistoric horizon with which artifacts of this sort were evidently directly associated.

Unifacially worked chert objects include end scrapers and side scrapers. End scrapers, of which there are 12 specimens, fall into two groups. Most common are scrapers with a prominent ridge along the back, either along the midline or to one side or the other. Only 2 have all-over retouching and retain no trace on their convex surface of the original surface of the flake used in their manufacture. Three of these specimens retain parts of the white matrix enclosing the stone of which they were fashioned. Scrapers of this group have the following size range: length 44 to 94 mm., mean 59.6 mm.; width 16 to 39 mm., mean 26 mm.; thickness 8 to 20 mm., mean 12.4 mm.

Three other scrapers are thin, low-backed specimens, made from thin spalls that required only edge retouching to make them serviceable. They range in length from 40 to 70 mm., in width from 20 to 33 mm., and in thickness from 6 to 7 mm.

Two side scrapers were made from thick planoconvex spalls, and have prominent ridges on the back. Retouching of the edges is limited to the long sides, not to the end, as with the preceding group. They measure 55 by 36 by 12 and 50 by 35 by 20 mm. Both are from house 1.

### WORK IN GROUND STONE

Six specimens only of ground-stone work are present, and these were made of sandstone and limestone. Abraders of sandstone were of two kinds. Two fragments are evidently from elongate shaft smoothers of the type commonly used throughout the Plains in pairs. The larger fragment, which has one finished end, is 85 by 32 by 30 mm.; it has a longitudinal groove on each of three sides. The smaller fragment, which has a groove on each of its four sides, is from a smoother of comparable size and shape. Some of the grooves seem too narrow and irregular for arrowshafts and probably result from awl sharpening.

A different type is represented by two fragments that fit together to form an incomplete block 82 by 42 by 18 mm. The two broader surfaces are worn concavely, from rubbing or sharpening activities. One edge has a narrow V-shaped longitudinal groove. The entire piece has unquestionably been dressed to shape, but its original size and form are conjectural.

A large milling stone was made from an irregular slab of limestone, dressed roughly to shape, and measuring 44.5 by 36.8 by 7.7 cm. The upper surface has an elliptical concavity, evidently produced by a rotary motion rather than by a to-and-fro grinding motion. No mullers were recovered, though unifaced manos of limestone and other materials have been collected from the surfaces of other sites in the locality.

From the same pit that produced the milling slab came another limestone slab, somewhat smaller, and measuring 25.4 by 22.8 by 6.3

cm. One surface is flat, but not certainly dressed. The other is uneven, and bears 9 shallow pits or "cups," each about 15 to 25 mm. in diameter, scattered irregularly over it.

### OTHER STONE OBJECTS

A flattish waterworn pebble, approximately 55 by 35 mm., has battered facets on the edge which were undoubtedly produced by use as a pecking or hammer stone. It does not appear to have been otherwise modified.

A quartzite pebble 35 mm. in diameter shows no workmanship beyond the removal of several small flakes. There is no way of determining whether this was accidental or purposeful.

### COMMENT

Despite the very limited extent of our work at the Griffing site, certain inferences seem warranted at this point. That the site was occupied by a semisedentary group is suggested by the presence of earth-lodge remains, these being indicated, as Brower inferred, by the occurrence of low mounds scattered loosely for some distance along the creek. The nature of the settlement, open and unfortified, and the presence of square or rectangular dwellings, further suggest relationships to other prehistoric communities of square houses widespread in the Central Plains. The subsistence economy doubtless included maize agriculture, with which was associated the metate-mano complex. Hunting and gathering, and perhaps the use of shellfish, can be inferred. No evidence of fishing was found; but bone fishhooks have been recorded from the immediate locality and I venture the guess they will eventually prove to be associated with the same culture as is represented by the Griffing site. As to the time of occupancy, it is safe to suggest that it was in pre-White days; I suspect, though, that it also predated any Kansa occupancy of the locality. The physical appearance and relationships of the people remains unknown, as does their method of disposal of the dead, but perhaps some form of mound burial can be suspected. Further work at this and related sites nearby ought to extend considerably the range of artifact types and other traits characteristic of the culture, and will thus make possible a much better cultural and chronological correlation with other prehistoric culture complexes of the region.

## KANSA VILLAGE SITE (14PO24), POTTAWATOMIE COUNTY

Kansas River and the Big Blue are both near grade and flow through their respective alluvium-floored valleys in meandering fashion. Northeast of Manhattan, a wide sweeping curve of the Big Blue throws the stream against its eastern bluff line until it is within half a mile of the Kansas. Here it turns sharply west for about a mile, then turns again to the south and east to its junction with the Kansas. Formerly, its westward direction continued for a mile farther, and its entry into the Kansas occurred at the east edge of Manhattan, more than a mile above its present mouth. At the narrow neck where the two streams most closely approached each other before their final junction, and on the north bank of the Kansas 2 miles east of Manhattan, is what remains of the principal village of the Kansa during, roughly, the first third of the 19th century.

The general appearance of the village during its occupancy is well described by Say (James, 1823, vol. 1, pp. 120–130), who estimated the number of lodges in 1819 at about 120. Its population seems to have been in the neighborhood of 1,500 persons. In 1880, the site was surveyed by the Kansas State Historical Society, and a map, on which figure 29 is based, was prepared. At that time (Anon., 1881, p. 287):

> . . . the village stretched from the banks of the Kansas river northward for the greater part of the distance towards the Blue. . . . The situations of the lodges are yet plainly marked by circular ridges and depressions, ranging in diameter from less than 10 feet to more than 50 feet. These, numbering about 160, exclusive of those which are quite small, were accurately measured and located.

A good many changes have taken place at the spot since it was abandoned by the Indians, and some have been of drastic nature. The site lies on a fine terrace rising some 30 feet above the river, and dropping off a few hundred yards to the east to a lower bottom across which Say and his party approached the town in 1819. Lateral erosion by the river has destroyed much of the site; what remains has been cut up by the Union Pacific railroad, by an evergreen nursery immediately north of the railroad right-of-way, and by years of farming. We were informed that the river has cut its north bank back by at least 30 or 40 rods within the memory of living persons; and a curving swale that may be the old line of the bend is shown on the 1950 edition of the Manhattan topographic quadrangle 400 yards or more south of, but within, the present horseshoe bend of the stream at this point. Unfortunately, the 1880 map prepared by the Kansas Historical Society includes no landmarks or other points by which correlations can be made with our partial map of the site, and so the actual extent of stream erosion cannot now be precisely determined.

At the time of our investigations, almost no surface traces of the old village were in evidence. We were told that much material, including iron, catlinite, stone, bone, etc., had been turned up in the nursery grounds, in the cultivated fields just to the west, and in the narrow triangular field between the railroad and the river bank. In the nursery area we were able finally to locate two pits containing refuse from the native occupation, and these we excavated. Tests in the field immediately to the west revealed areas with refuse-mixed

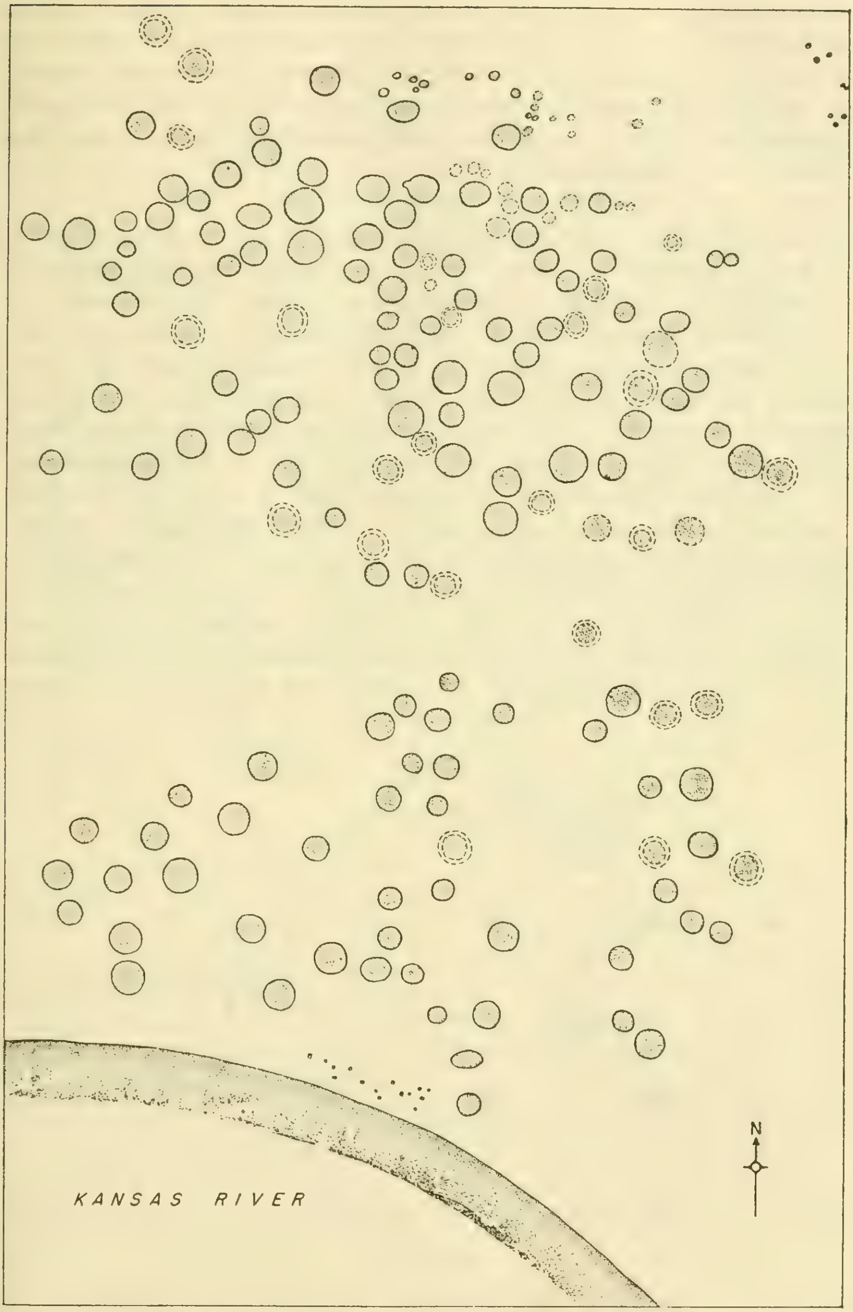

FIGURE 29.—Map of Kansa village site, 14P024, east of Manhattan, between Kansas and Blue Rivers. Large stippled circles, house depressions; small circles, cache pits(?); small squares, graves(?). Based on Kansas State Historical Society survey, 1880.

soil and traces of what were possibly two house sites. The cut bank of the river showed disappointingly little material; but in the west end of the field south of the railroad, where the stream came closest to the right-of-way, a house site was finally located and excavated. This house lay just east of the point where the river intersects the line between sections 9 and 10.

### HOUSE 1

The house floor we uncovered here was circular in plan and 28 to 29 feet in diameter (fig. 30), with a well-defined line separating the house fill from the undisturbed surrounding soil. At the center, 18 inches below ground surface, was a well-marked fireplace approximately 30 inches in diameter, filled with hard-packed ashes and underlain by fire-reddened earth to a depth of nearly 9 inches. A second fireplace, 24 inches in diameter, lay 8 feet to the north, partly overlapping the edge of an earlier, probably prehouse, basin measuring 7½ by 4 feet. At a radius ranging between 66 and 78 inches from the hearth center were four postholes, each 10 to 12 inches in diameter by 21 to 24 inches deep, and forming an approximate 8 to 9 foot square about the hearth. Nine smaller holes, each 4 to 7 inches in diameter by 8 to 15 inches deep, lay farther away, at a radius of 10 to 12 feet from the fireplace. The entrance passage, about 5 feet wide, opened toward the east, being readily traceable for 12 feet beyond the house

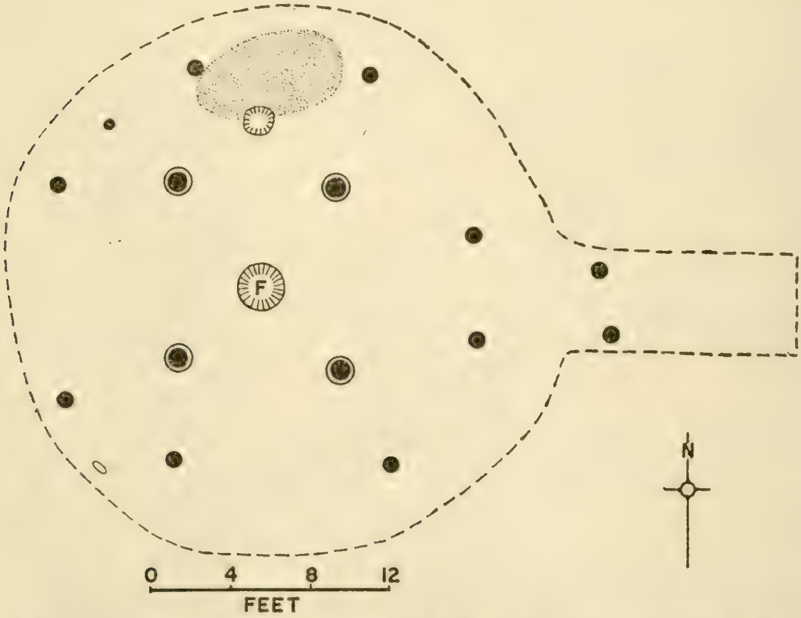

FIGURE 30.—Floor plan of Kansa earth-lodge site, house 1, near Manhattan (14P024). Solid circles indicate postholes; rayed circles, fireplaces; stippling, prehouse basin or cache; broken line, approximate edge of house.

wall. Of the posts that must have supported the walls and roof of the passage, the only evidence was two postholes near the house wall. Beyond the end of the passage was a heavily mixed area, which continued some 12 inches below the level of the entrance (pl. 16, *a*).

There were no cache pits within the house, unless a small pit near the northwest wall be so considered. This measured 10 by 16 inches, with a depth of 10 inches; its fill contained quantities of charred corncob fragments, bark, and grass, as did that in the two west main postholes. On the house floor, in the basin at the north side, and in the fill immediately above the floor, were quantities of broken animal bone, as well as gun parts, steel-trap fragments, musselshells, and a few native-made artifacts, but no sherds.

Two burned fragments of the nest of a mud dauber wasp were also found among the burned house daub on the floor. According to K. V. Krombein, United States Department of Agriculture, they probably represent *Sceliphron caementarium*, the common mud dauber of the United States.

The general plan of the house floor and the arrangement of posts resembles that found in historic Pawnee sites and strongly suggests an earth lodge. That the structure which once stood here was probably earth covered is also suggested by the presence of small chunks of fire-hardened grass-impressed clay. The presence of this structure is thus in line with the observations by Say that the Kansa were dwelling in earth lodges, rather than in bark-covered or mat-covered structures, when he visited the tribe in 1819.

### CACHE PITS

In the grounds of the Kansas Evergreen Nursery north of the railroad we examined several holes left in the recent removal of nursery stock. In and around one were noted bone fragments and pieces of heavily oxidized iron, brass, and other contact materials. Further tests disclosed the presence of two undisturbed pits nearby which we excavated. These lay about 65 and 80 yards north of the railroad. Pit 1 measured 42 by 48 inches at the surface, was 48 inches deep, and had a floor diameter of 69 inches. It contained a very dark fill heavily mixed with ashes, charcoal, some animal bone, iron, and brass fragments, but without pottery. The second pit, whose measurements I somehow neglected to record, was smaller but had a similar content of bones, iron, and brass but no native artifacts or pottery.

### BURIALS

Some 350 to 400 yards east of house 1, where the village terrace drops away to a lower level, recent cultivation had evidently disturbed a grave or burial area. Scattered over the freshly tilled surface were many fragments of human bone, all so badly shattered as to be not worth salvaging. There were also glass beads, copper or brass buttons, metal-lace fragments, shreds of cloth, and other bits of former garments. All of this came to light, of course, just at the end of our stay; and in the hour or two we devoted to a search for graves none was found. A small sample of the cultural material was preserved, however, and is described elsewhere in this paper. It seems possible that further investigations carried out in more leisurely fashion than were ours would turn up intact or less completely demolished graves that could be properly worked out and recorded.

### FAUNAL REMAINS

Broken and shattered animal bones occurred in some quantity in the house site and in the pits. Most of these were apparently from bison. Among the less fragmentary materials brought in to the National Museum were identified the following species, listed in order of abundance of bones present:

| | |
|---|---|
| White-tailed deer (*Odocoileus virginianus*) | 18 |
| Black bear (*Euarctos americanus*) | 2 |
| Horse (*Equus caballus*) | 1 |
| Bison (*Bison bison*) | 1 |
| Puma (*Felis concolor*) | 1 |
| Beaver (*Castor canadensis*) | 1 |
| Pocket gopher (*Geomys bursarius*) | 1 |
| Raccoon (*Procyon lotor*) | 1 |

Birds are represented by two bones of the wild turkey (*Meleagris gallopavo*).

### MOLLUSCAN REMAINS

The unworked shells of fresh-water mussels were surprisingly plentiful everywhere in our excavation, and fragments were scattered generously throughout the plowed soil wherever we made tests. The absence of workmanship on the shells, of any shell artifacts, or of pottery that might have required shell tempering, makes it seem likely that the mussels were gathered primarily for food. Probably most or all of the species represented were readily available in the Kansas or Big Blue Rivers near the village, or in some of their smaller tributaries nearby. Listed in order of their abundance, the following species are represented:

| | |
|---|---|
| *Lampsilis ventricosa occidens* (Lea) | 10 |
| *Obovaria olivaria* (Raf) | 3 |
| *Amblema costata* (Raf) | 2 |
| *Pleurobema coccineum solida* (Lea) | 1 |
| *Fusconia flava* (Raf) | 2 |
| *Quadrula pustulosa prasina* (Conrad) | 1 |
| *Proptera laevissima* (Lea) | 1 |

### VEGETAL REMAINS

No identifiable vegetal materials were returned to the National Museum. The only such items noted in the excavations were charred corncob fragments, bark, and grass from features already noted in house 1.

### ARTIFACTS OF NATIVE MANUFACTURE

Objects of native manufacture were few in number, limited in variety, and of practically no usefulness in tracing relationships with contemporary or earlier native cultural manifestations. Nowhere on the site did we find any Indian pottery nor did we learn of any ever having been found here, either on or under the surface. Worked stone and bone occurred, but they were scarce. Our limited sampling suggests that the Kansa by the first quarter of the 19th century had given up most of their native material culture and were relying largely on the American traders to supply their needs for tools, weapons, and utensils. I have a strong impression that aboriginal manufactures are proportionately much scarcer on this site than they are on contemporary Pawnee, Arikara, and other sites of the same period farther to the north. This is, after all, what might be expected of a tribe that had been for well over half a century in direct contact with white traders and that, for a considerable time, resided on or near a major trade artery of the region.

Work in bone includes two piercing tools and a possible gaming piece. Of the first, one is the fibula of a puma (*Felis concolor*), from which the proximal extremity has been detached and to which a short, thick, well polished point has been given; the distal end shows no modification. The skewerlike object thus produced (pl. 18, *a*) is 20 cm. long. A shorter heavier implement, made from the shaft of an unidentified mammal bone, is pointed at one end and pierced at the other (pl. 18, *b*). Suggesting a sewing tool, it is 14.4 cm. long and is well polished. The third piece is the toe bone of a deer, dressed to a conical form and with both articular surfaces removed. Just above the base of the cone is a 4-mm. perforation; the entire surface and the tip are well smoothed (pl. 18, *c*). This may be one of the pieces from a ring-and-pin game set, but the reason for the perforation is not at all clear.

A deer antler artifact consists of a 70-mm. segment of tine, with the tip broken off and the other end cleanly cut off with, apparently, a metal saw. The cut end has been smoothed, and the cancellous tissue has been gouged out to produce a cavity 12 mm. in diameter by 10 mm. deep. The piece somewhat suggests a handle, but the socket seems too shallow and broad to have been very serviceable in seating a cutting, scraping, or piercing element.

The only fired-clay specimen we found was a rectangular block about the size and shape of a domino and evidently molded with some care (pl. 18, *e*). It measures 48 by 25 by 12 mm. and lacks any markings that would aid in identifying its use.

Worked stone was somewhat more plentiful but not much more definitive. Two rectangular blocks of sandstone suggest whetstones for sharpening metal tools. The smaller, measuring 50 by 31 by 14 mm. and broken at both ends, has a rectangular cross section and worn surfaces. The larger is 80 by 52 by 23 mm.; it is deeply worn and smoothed around the middle, and less so at the ends. Also of gray sandstone is a small pipe bowl, represented by two fragments 25 mm. long from the junction of stem and bowl bores. The bowl appears to have been slightly constricted at the middle and was apparently fitted with a stem of wood or other soft material; its interior is fire blackened and has traces of a "cake" at several points.

Catlinite is represented by five worked pieces. Four of these, including a small pipe fragment not further classifiable as to form, are from house 1; except the pipe fragment, these look like rejectage. A fifth and larger lump has one cut surface and is otherwise polished as though from long carrying in a bag. Most of these pieces seem to be of fairly high quality stone, and doubtless originated in the Minnesota pipestone quarries.

Only two pieces of chipped stone were found. One is small, thin, and very clumsily worked; it has a stem, two broad barbs, and a blunt tip. Possibly a crude projectile point is indicated, but if so it would seem to have been a very ineffective tool. The second piece is apparently a chopping or scraping implement. It has a curved unifacially chipped cutting or scraping edge 70 mm. long, above which are two broad shallow notches for hafting; above these is the thick unmodified back.

A small quartzite pebble, apparently dressed to a round flattish shape, measures 32 by 42 mm.; its purpose is unknown.

### OBJECTS OF WHITE MANUFACTURE

Objects of White manufacture occurred almost altogether in a fragmentary state and in poor condition. They indicate, however, that firearms, steel traps, cutlery, household utensils, trade textiles, and articles of personal adornment were present; and some of these items, it would seem, must have been fairly plentiful. Although no maker's marks have been found on the specimens, all appear to have been materials characteristic of the period for which Kansa occupancy of the site can be documented or from a slightly earlier time.

The presence of firearms is attested by 7 gun fragments and 3 gun flints. Three lockplates (pl. 19, *f*) from house 1 range in length from 132 to 150 mm. The smallest of these still carries the frizzen; and a gooseneck cock, or hammer, found nearby is very likely a part of the same mechanism. This probably came from a pistol of pre-1800 manufacture. The other two lockplates are smaller than those from military weapons of the period; they may be from light muskets or rifles intended for civilian use or the Indian trade, or less probably are also from pistols. Four sections of gun barrels vary in length from 50 to 150 mm., and two of these have been hammered flat. All appear to be of light stock, suggesting pistol barrels rather than muskets. The gunflints, also from house 1, are of very dark gray English flint; all are flat and tabletlike, nearly square, and none exceeds 21 mm. in maximum dimension by 7 mm. in thickness. They were probably designed for pistols, but were usable in light muskets as well.

Cutlery is represented by five knife-blade fragments and two incomplete handle elements of bone. What was probably a butcher knife has an 18-cm. curved and tapered blade and a 5-cm. tang. Another fragment, 13.5 cm. long, may be from a table knife, as are two other smaller pieces. One of the latter (pl. 19, *e*) consists of the basal part of the blade and adjoining tang with ferrule; the other is the tang below the ferrule, with three transverse rivets and bits of the wooden handle still adhering. Still another fragmentary table knife from pit 3 included part of the blade, ferrule, and tang. Of the two knife handles represented, one is a tubular piece, stained light greenish inside and out, highly polished on the exterior surface, and with decorative beading at the basal end (pl. 18, *d*). The second is a short sliver from one side of a handle, beveled along both edges, and showing one rivet hole 8 mm. from the slightly hollowed cut end.

Other objects of iron included part of the spring of a large trap (pl. 19, *d*) and the pillar of another. A third piece is either another spring fragment or a heavy latch bar. From house 1 came the handle sockets of two axes, made by bending a heavy iron band into a circular or elliptical shape and hammering the ends together to form the blade, which is missing from both our specimens (pl. 19, *a*). The house site also yielded two arrowpoints cut from sheet iron. One is a plain triangle, with the tip broken off; it measures 40 by 20 mm. The other has a short square stem and sloping shoulders; including the stem, it measures 44 by 23 mm.

Brass is present chiefly in the form of miscellaneous scraps of sheet, most of them with perforations, rivets, rivet holes, or thin cuts and slashes suggesting metal chisel marks. There is also the bail ear from a large kettle, to which the ear was secured with two iron rivets (pl. 19, *b*). The face of a two-piece brass button, 22 mm. in diameter and with crimped perimeter, was found in house 1; traces of the original wood (?) backing still adhere to the reverse side.

A pointed strip of lead, bent into a hook, is apparently a piece of scrap metal.

Earthenware includes five pieces. Two of these are small redware sherds with a greenish cast and high glaze on the interior surface. According to C. M. Watkins, associate curator of ethnology, United States National Museum, they are of a type manufactured over a long period, probably including the first quarter of the 19th century. There are also two stem fragments of white earthenware pipes, as well as a fragment showing part of the stem and bowl, with a prominent down-pointing spur on the latter (pl. 18, *f*).

Beads from house 1 include a short cylindrical glass specimen, 3 by 3 mm., and two of tubular shell (?), 3 mm. in diameter and 8 and 17 mm. long.

In addition to the Euro-American items described above from the house and pits, we obtained similar material from the surface of the disturbed burial area; but here no native artifacts were noted. Seven brass buttons are all of one-piece style, flat and fairly heavy, and with a stout wire loop soldered to the back of each. They occurred in two sizes. The smaller ones, 3 in number, averaged 19 to 20 mm. in diameter. Removal of the oxide coating from the reverse of one showed a depressed band in which raised letters spell out the words BEST and COLOUR, each preceded and followed by a 6-pointed star. One of these buttons has a bit of dark woolen fabric still caught in its loop; another was evidently attached to a strip of metal lace. The four larger buttons are 24 mm. in diameter. On the reverse, 2 lines encircle the loop; between these and the outer edge is stamped the legend RICH GOLD COLOUR, with a conventionalized floral motif at the bottom (pl. 18, *i*).

What appears to be a brass knee buckle lacks the tongue and is otherwise undistinguished; it measures 30 by 37 mm. (pl. 18, *k*).

Beads include a large spherical red specimen with white core, and diameter of 17 mm.; a small blue, 3 mm. in diameter; and 9 of shell, tubular, 3 mm. in diameter by 6 to 9 mm. long.

Perishable materials include several scraps of brown and black, or dark blue (?), woolen goods and three small pieces of metal lace. The woolen fabric is a napped plain or cotton weave (over-and-under), evidently machine made, and with most of the surfaces obscured by the matted nap. In one instance, two pieces of different color have been stitched together with cotton thread; and I suspect that the brown served as the lining for a dark-blue or black garment.

The best preserved piece of lace is a strip 20 mm. wide. It consists of about 20 cotton warps with which were interwoven fine copper wires used in pairs. The weave is basically an over-two-under-two; but it is varied by triangular areas in which the copper wire wefts cross from 3 to 7 warps before resuming the usual weave. Traces of the cotton thread by which this strip was secured to a woolen shirt or jacket are still visible. Two smaller lace fragments are apparently part of a similar fabric; but they lack finished edges and are probably from a wider strip. This lace (pl. 18, *j*) would seem to have been a finer and probably more costly goods than the copper strip-wire-cotton lace I have elsewhere described from the early 19th century Leavenworth (39CO9) Arikara site near Mobridge, S. Dak. (Wedel, 1955, p. 146).

### GENERAL COMMENTS

From our point of view, the excavations here at site 14PO24 can only be characterized as disappointing. As an attempt to apply the direct-historical approach to the archeology of the Kansa Indians, we ran into a dead end. It had been our hope, of course, that the site would yield a sample of native pottery and other artifacts of Indian origin in sufficient quantity and variety to suggest relationships with some of the earlier sites in northeastern Kansas. A definable complex of this sort obtained at a datable site whose tribal authorship is beyond question might have pointed the way to identification of a Kansa sequence. As the foregoing pages show, however, we failed to find such a complex of aboriginal traits; and in view of the obvious extent of White influence here, I am pessimistic about such a complex ever being defined at this site. Our work here, it is true, was extremely limited; and perhaps sustained observations and more extended digging would still turn up helpful leads to earlier phases of Kansa culture. For the present, we can only remark that, on the basis of archeological evidence, the Kansa at this point in history were living, as Say noted, in a large and fairly compact village of earth lodges, that they were following a subsistence economy based on maize agriculture and on hunting, and that they were heavily under the influence of White trade. In these respects, they had much in common with other village tribes of the eastern Plains; but their native material culture was apparently even more completely shattered than was that of the Pawnee and Arikara. I see nothing in what we found that would relate the local complex at 14PO24 to the earlier Doniphan and Fanning sites along the Missouri to the northeast, or to any other known pre-1800 tribal complex in the region.

## OTHER SITES AND MATERIALS IN THE MANHATTAN AREA

In addition to the limited excavations above described at the Griffing and Kansa Village sites, we made brief tests at several others nearby; and members of our party visited a number of other village and camp sites reported by various individuals in Riley, Pottawatomie, Geary, and Wabaunsee Counties. None of these observations yielded very much artifact material; but what they did produce strongly suggests that additional research at certain locations ought to be well worth the effort.

We also examined a large collection in possession of Dr. N. L. Roberts, now deceased, of Manhattan. This included a great many gray chert artifacts of various forms illustrating the core industry of the Kansas River valley, together with small samples of pottery from various village sites and other materials obtained in mound excavations. Practically all of this was collected, according to Dr. Roberts, at sites within 10 or 12 miles of Manhattan—most of it from the Blue River valley below Juniata Crossing, from Wildcat Creek below Keats, and from Deep Creek near Zeandale. With exception of a few village site specimens and small lots from three burial mounds, Roberts' material was not identified as to site provenience. Through the kindness of Mrs. Roberts, a representative series of specimens from this collection was subsequently presented to the national collection.

Though the observations mentioned in the foregoing paragraphs cannot be regarded as definitive, they include some that are certainly suggestive, and therefore merit some further comment here.

### SITE 14PO25 (BROUS)

Lying approximately half a mile west of the Kansa Village site (14PO24), this is in all likelihood the location reported by Brower (1898, p. 61, and 1899, p. vi and map) as the Brous site. It is situated on the same Kansas River terrace as 14PO24, about 30 feet above the river channel and some distance from the present bank. According to Brower (1898, p. 61), this was—

> the site of an ancient village, which had been submerged by the overflow of the Big Blue River. A cut on the Union Pacific Railroad through the site exposed the flint implements and pieces of pottery which lie about 3 feet below the present surface of the ground, covered with sedimentary deposits by overflowage.

Very little cultural material was visible on the cultivated ground surface. We dug a series of small test pits at random immediately north of the railroad right-of-way, and about 100 yards from a United States Coast and Geodetic Survey benchmark, No. G–115, elevation 1,013.931 feet, m. s. l. These disclosed a dark-gray topsoil to about a 24-inch depth, the color becoming somewhat lighter with increasing depth. At 24 inches, there was a light gray stratum 6 to 8 inches in thickness, in which bits of charcoal and burned clay were detected. In one test pit, this layer yielded also flint chips and a few potsherds; elsewhere, other flints and a large stemmed point were found at this level. In general, the tests yielded discouragingly little cultural material. Most of it, however, came from the 24–32-inch level, below which was only clean undisturbed subsoil; and this, apparently, is the main archeological zone. Its areal extent was not determined, but it may be as much as 2 or 3 acres, possibly somewhat more. The overlying soils are probably, as Brower suggested, sedimentary material deposited by overflow from the Big Blue, the Kansas, or both.

Artifacts from the site include 32 potsherds and 5 stone objects. Many of the sherds are weathered, so that their original surface finish is uncertain; but no cord-roughened pieces can be recognized. All are tempered with rounded sand particles, usually abundantly present and of moderately coarse texture; several have flecks of mica showing on their surfaces. The sherds tend to crumble rather easily. Color varies from brown to gray, the paste core usually being considerably darker than in Riley Cord-roughened and sometimes nearly black. Hardness seldom exceeds 3 to 3.5. Plain exterior surfaces are characteristic of the sherds; but at least 5 have distinct impressions from an edentate rocker (fig. 31, *b*). One weathered rimsherd bears on its convex outer surface crossed lines that may be dentate stamp impressions, below which are traces of a row of punctates. Three other rimsherds appear to be from bowls. Another sherd has a row of punctates at what was evidently the neck of the vessel. All of these features set the sherd sample apart from the Riley Cord-roughened pottery found on most local sites, but not noted by us here at 14PO25; and they suggest a Hopewellian tradition or complex.

Chipped stone includes one large stemmed projectile point, coarsely chipped, from which the extreme tip has been broken (fig. 31, *a*). The stem expands and the base is straight; the piece measures 63 by 30 by 8 mm., and weighs 18 gr. Another piece, roughly triangular in outline, with convexly curved edges and base, measured 75 by 35 by 12 mm.; it may be a knife or a projectile point blank. There is a basal fragment of a second similar piece. Two other coarsely flaked fragments are the rounded ends from large blades or blanks.

A single piece of ground stone was recovered. This is a small fragment of igneous material, with one rounded edge and a smoothly hol-

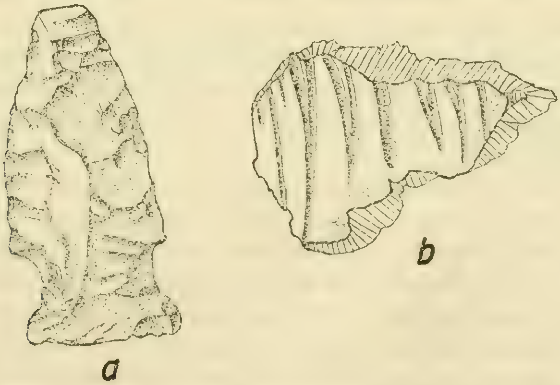

FIGURE 31.—Stemmed projectile point and rocker-marked potsherd from Brous site, 14P025, east of Manhattan (USNM 381670, 381671).

lowed surface. It looks like a sliver from the end of a small grinding or polishing slab approximately 30 mm. thick.

The cultural affiliations of this material would seem to be not with the numerous local village sites on which Riley Cord-roughened pottery predominates, but with a Hopewellian or Hopewellian-influenced complex probably related to certain sites in the Kansas City locality (Wedel, 1943). Possibly further search on the spot would disclose areas from which a larger and more definitive sample than ours could be recovered. In any case, that the site is apparently not unique in this locality is suggested by our findings on the lower Vermillion River some 18 miles to the east.

### SITE 14PO26 (DIKE)

Following again in Brower's footsteps, members of our party surface-hunted a section of the Vermillion River valley east of Wamego. Here, according to Brower (1898, p. 67), on "a regularly formed terrace, the Dike Village Site, was discovered, where potsherds and flint implements were scattered over the surface of the cultivated field for nearly half a mile." Elsewhere (Brower, 1899, p. 103), he figures a vessel, almost certainly a restoration, in which the rim decoration of crosshatched lines with punctates on the neck below, is reminiscent of Hopewellian pottery. From Brower's text it is not clear whether the Dike site was east or west of the Vermillion, but the only site shown in this locality on his maps is on the east side. Our search yielded nothing on the east bank; but on the west side, about 1½ miles north of Kansas River, an area with sherds and flints was discovered. To this, located as is Brower's Dike site in section 31, T9S, R11E, is here assigned the designation 14PO26.

We did no digging here and only surface-collected materials are at hand. They include 13 sherds and about the same number of worked stone specimens. Three sherds, including two rims, are of Riley Cord-roughened type. The other 10 consist of 7 plainware sand-tempered body sherds; 2 body sherds with rocker impressions; and one rimsherd thickly tempered with angular particles of hornblende (from crushed granite?) and bearing on its convex outer surface a series of vertical rocker impressions below which the neck carries a row of crescentic punctates (fig. 32, *a*).

Chipped flints, like the pottery, suggest two traditions. There are two well-made symmetrical projectile points of unnotched triangular form, each with slightly concave base and convex lateral edges; they measure 27 by 15 by 3 mm., and weigh 1 gr. each. Much more common are large stemmed points. Of these, there are six whole, or nearly whole, specimens and four basal fragments of the same type. These all have an expanding stem with straight or convex base; all are thick, heavy, and coarsely chipped (fig. 32, *c-e*). The complete or nearly

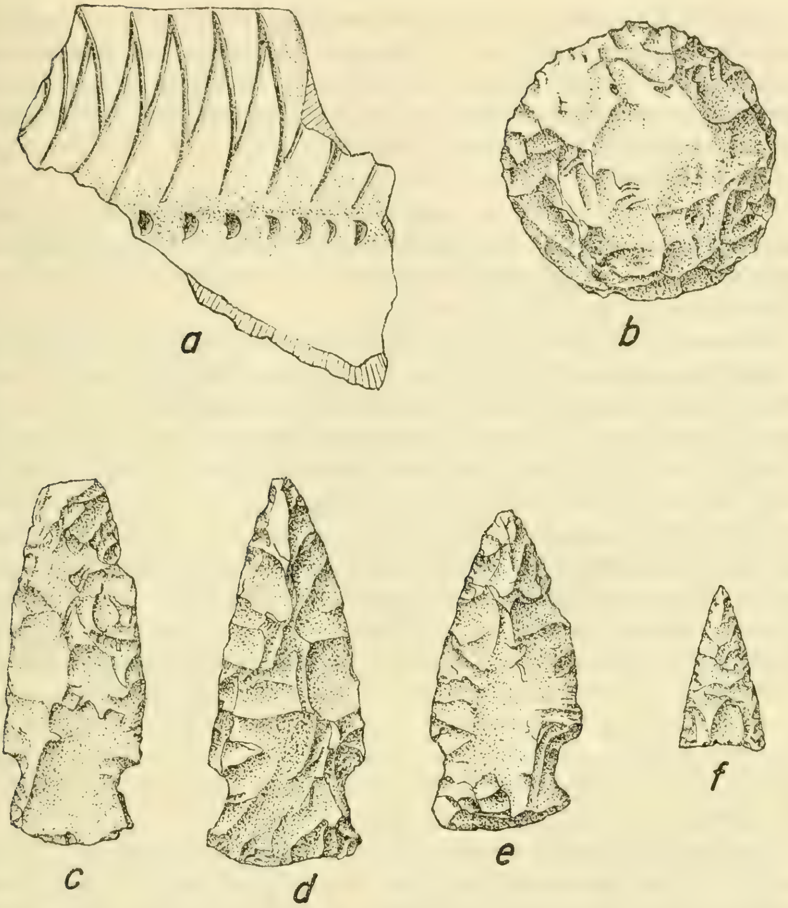

Figure 32.—Rocker-marked rimsherd, chipped flint disk, and projectile points from Dike(?) site, 14P026, east of Wamego (USNM 381694, 381695).

complete specimens range in length from 43 to 65 mm., in width from 20 to 30 mm., and in thickness from 5 to 12 mm.; their weight varies from 5 to 15 gr., but averages approximately 13 gr. The size and weight range of these larger pieces is well within that represented by the projectile points characteristic of the Renner site near Kansas City, and the form is generally substantially the same also (Wedel, 1943, p. 50 and pl. 12).

Two chipped-flint disks are also reminiscent of the Renner site. One is nearly circular in outline (fig. 32, *b*), somewhat flattened in cross section, well made and with the edge retouched all around; it measures 46 mm. in diameter by 16 mm. in thickness. The second is smaller, slightly longer than wide, and part of the edge is not retouched; it measures 47 by 35 by 16 mm.

Other flint objects include two knives, both subtriangular in shape, with straight to slightly convex base, convex edges, and one pointed end; both are coarsely flaked on both faces. They are 74 by 35 by 16 mm. and 70 by 45 by 19 mm. in size. A planoconvex end scraper is fashioned from a large curved flake 75 by 35 by 17 mm.; the edges are irregular and indifferently retouched.

A piece of dull red stone suggesting catlinite, but probably a very fine-grained sandstone, has the marks of pecking over much of the surface and the edges have been ground to produce a celtlike form. It measures 115 by 63 by 25 mm.

Here again our sample is too small to permit positive identification of the site as to its cultural affiliations; and a further element of uncertainty is introduced by the fact that all of the material was collected from the surface. To me, the material suggests two complexes of different age. The Riley Cord-roughened sherds and possibly the two small unnotched projectile points affiliate with the rectangular house complex characteristic of the locality. The majority of the sherds, the large stemmed points, the chipped disks, and perhaps other items are reminiscent of Hopewellian materials. Whether they represent an actual occupation by Hopewellian peoples or, alternatively, reflect Hopewellian influences on a native population with other antecedents, must be left for future more extended investigations. It would not be at all surprising if systematic search in this section disclosed the presence of Hopewellian village sites with close relationships to those now known in the Kansas City locality slightly more than 100 miles to the east down the Kansas River (Wedel, 1943).

The likelihood seems strong that a third ceramic complex occurs in the vicinity of Manhattan, perhaps primarily in sites along the lower valley of Big Blue River. Brower (1898, p. 65) figures a small-mouthed squat-bodied vessel with two handles, and bearing incised or trailed and punctate decoration, from the Hill site not far below the mouth of Carnahan Creek. This is markedly unlike any of the pottery we found or saw in the area, and the decoration suggests Oneota or Oneota-influenced pottery. Further search could perhaps profitably be undertaken at this site. Brower also mentions (1898, p. 61) a site near Rocky Ford where the people "made catlinite pipes and earthen vessels, evidences of which have been catalogued." Farther downstream, he noted "a considerable group of lodge-circles and two or more artificial mounds" on the Richards farm; and he stated that "The circles or hut-rings are very distinct though of much greater age than those at the Kaw village, three miles down the river." At this point, on a narrow apron at the base of the east bluffs of the Big Blue, we saw a shallow house ring some 30 feet in diameter and a few mounds; but we were refused permission to do any testing or to examine materials said to be from the spot. If in one or more of these seemingly late villages the existence of an incised potteryware could be established, the question of its possible relationship to Oneota materials on the Missouri and to a late prehistoric or protohistoric Kansa Indian occupancy would present a challenging and interesting problem.

### MOUND MATERIALS

Of the numerous mounds and cairns that formerly occurred at many points on the Big Blue and Kansas River bluffs, most have apparently been destroyed and few still remain untouched. We opened one supposed cairn, with negative results that merit no further comment here. From such published accounts as exist, and from the oral reports given us, it would appear that some of these structures were perhaps erected in historic times and yielded exclusively materials from the period of White contact. Others were evidently older and perhaps originated at various times and from several cultural levels in the prehistoric period, though it seems likely that historic Indians not infrequently buried intrusively in such structures. The scant and not altogether satisfactory data to be presented briefly here were furnished by the already mentioned Dr. Roberts, of Manhattan, and concern only mounds opened by him personally. The artifacts recovered are in the national collections.

#### FREMONT POINT MOUND NO. 1

Largest of the mounds opened by Roberts was on a spur of the bluffs south of Kansas River, known locally as Fremont Point, about 2½ miles southeast of Manhattan and some 200 feet above the valley floor. The mound is said to have been 10 or 12 feet in diameter and about 2 feet high. Just beneath its surface was an irregular and discontinuous layer of limestone slabs and blocks. A circular pit about 6 feet in diameter had been dug to a depth of 3 feet below the original ground surface, and this was lined with a rough dry-masonry wall. The earth within the pit and immediately above contained numerous fragmentary human bones, some of which had been scorched and fire blackened. There were no articulated burials and no complete bones. Scattered among the bone fragments and throughout the fill were bone and shell beads, chert arrowpoints, and two shell pendants. No glass, metal, or other White contact material was found. The general impression of the excavator was one of complete disorder in the original deposition of the human and other materials recovered. No estimate was made of the probable number of individuals represented; but Dr. Roberts, a dentist by profession, said he observed more than 300 human teeth among the remains.

Tubular bone beads to the number of slightly over 800 were recovered, these being by far the most common artifact type in the mound.

Many have been discolored by heat to a black, blue-gray, or white, and broken or split pieces are common. They were apparently made from bird or small mammal bones by the simple procedure of detaching the ends and rubbing down the cut. They vary widely (pl. 20) in size, with diameter ranging from 2 to 10 mm. and length from 6 to 49 mm.; but 60 percent are less than 3.5 mm. in diameter and 70 percent are under 16 mm. in length. Decoration occurs on about 365 specimens (48 percent). It consists of 1 to 12 incised lines encircling the tube; these are sometimes very shallow, at other times deep enough to reach the interior cavity of the bone. In many cases, they are not continuous but consist of a series of 3 short cuts or nicks whose ends may overlap slightly but usually do not quite meet. Some specimens are cut so regularly and deeply as to suggest an attempt to divide the tube into a number of smaller segments, but there are no beads as small as these segments usually are. In only two instances is the incising in a continuous line to form a spiral.

Shell objects are next in order of abundance. There are approximately 180 disk beads (pl. 20). They vary in diameter from 7 to 12 mm. and in thickness from 1.5 to 5.0 mm.; the central perforation is from 3.5 to 5.0 mm. in diameter. Many of these are fire darkened and crumbly, and some of the thinner specimens probably result from splitting. All are probably of fresh-water mussel shell. The only marine species represented is a single shell of *Marginella apicina* Menke, which has had the spire ground away to permit stringing. This species is native to the waters from North Carolina to the Gulf of Mexico and the West Indies. There is also one short thick barrel-shaped shell bead measuring 8 mm. in diameter by 12 mm. long.

Two pendants were apparently also made of fresh-water shell. Both are elliptical in outline, approximately 35 mm. long by 17 mm. wide, and are perforated at each end. In the heavier specimen, which is nearly 7 mm. thick, the perforations run obliquely from one slightly concave surface to emerge at the ends (pl. 20).

Projectile points number 35; they represent a variety of gray, whitish, pink and other cherts, and a rather curious range in forms (pl. 20). Eleven have a basically triangular outline, with or without side and/or basal notches. In terms of the shapes defined by Strong (1935, p. 88), these break down further into NBa (2 sp), NBa1 (3 sp), NBa2 (1 sp), NBa3 (3 sp), and NBa4 (2 sp). Workmanship is variable, but several are very well made. In size, they have the following range: length 16 to 35 mm., mean 24.5 mm.; width 11 to 15 mm., mean 13.4 mm.; thickness 2.5 to 4.0 mm., mean 3.1 mm. The largest weighs just under 2 gr.; combined weight of the 11 is between 9 and 10 gr.

Quite different are 24 stemmed points (pl. 20), all of them small, slender, and well made. The stem results from corner-notching and thus expands toward the base. The base is distinctly convex in eight specimens; in the others it varies from straight to slightly concave. The lateral edges are usually straight, and in about half the points fine serrations run from the shoulders to the tip. Size range is as follows: length 18 to 34 mm., mean 25 mm.; width 8 to 14 mm., mean 9.9 mm.; thickness 2.5 to 4.0 mm., mean 3.3 mm. The largest stemmed point weighs less than 1 gr., and the combined weight of all 24 specimens is 15.5 gr.

### FREMONT POINT MOUND NO. 2

Approximately a mile southeast of the preceding mound, and also on the south bluffs of Kansas River, a second and smaller mound was opened by Dr. Roberts. Beyond the observation that it was very small and inconspicuous, no details are available as to its manner of construction and internal arrangement. It is said to have consisted almost entirely of earth, and to have contained no trace of human remains. Within the mound was found a small quantity of red ocher and the worked canine tooth of a bear. The latter has been split and modified to such an extent that species identification—as between black bear and grizzly—is no longer possible. Most of its surface is well polished from use. Near the basal end are two transverse incised lines. Two conical holes, 3.5 mm. in diameter and 12.0 mm. apart, have been drilled through the root. The specimen is 68.0 mm. long (pl. 20).

### MOUND NEAR ROCKY FORD, POTTAWATOMIE COUNTY

The third mound excavated by Roberts was situated on the bluff top east of Big Blue River, a mile or slightly more northeast of Rocky Ford. This was apparently on the ridge between the river and Cedar Creek, not far from the east end of Tuttle Creek dam, and a short distance west of a stone cairn said to have been mentioned by Brower near the mouth of Cedar Creek. The mound was quite small—not over 5 or 6 feet in diameter by 1 or 2 feet high; and it was composed almost entirely of earth, with only a few scattered stones included. There was no evidence of a pit beneath the mound, nor was there any trace of human bone. A few small objects of metal, glass, bone, and shell lay at the base of the mound; and it was the opinion of the excavator that if a burial had been made here, it was probably similarly laid on the original ground surface and covered over with earth.

Glass beads included 27 pale blue and 3 white specimens, all weathered and faded, and none exceeding 3 mm. in diameter. Metal consisted of 3 brass wire coils; the two larger, 30 mm. in diameter, consisted of 1½ turns each, whereas the smaller, 12 mm. in diameter, consisted of 5 turns. Shell objects included 12 disk beads, 8 to 9 mm.

in diameter by 1.5 to 5 mm. thick, with cylindrical perforations 3.0 to 4.5 mm. across; some of these were fire blackened. There was also a corner fragment of a pendant, with two finished edges and a perforation. Tubular bone beads numbered eight, equally divided between plain and incised specimens; length varied from 8 to 23 mm., diameter up to 3.5 mm. Two of the incised specimens have annular cuts; the other two were spirally incised, with successive turns from 1 to 1.5 mm. apart. The base of a small stemmed point, with concave base, and maximum shoulder width of 10 mm., completes the specimen inventory from the mound.

I am not prepared to say just where the three mounds sketchily recorded above will fit into the archeological sequence for the Manhattan locality; but it seems fairly probable that they originated from more than one period of occupation. If we had detailed descriptions of the numerous earlier mound explorations hereabouts, or if the collections then made and their associations had been preserved somewhere for later study, patterns of some sort might be apparent. As matters stand now, the uncertainty concerning relationships of the mounds opened by Roberts may be regarded as more or less symptomatic of the general haziness that exists relative to the history of native occupations in this locality. There are suggestive bits of evidence, but little of a substantial nature into which one can get his teeth.

The Rocky Ford mound, apparently like some of the small ones previously opened, suggests historic connections, at least in part; and perhaps it is to be linked with protohistoric Kansa or some still unidentified tribe resident in, or temporarily inhabiting, the lower Blue-Kansas River locality. The bone and shell beads and the stemmed point fragment are reminiscent of apparently earlier materials of fairly wide distribution; but since they were found in such small number at Rocky Ford, it is possible they were accidentally or incidentally interred at a relatively late time with the corpse of an individual not actually associated with them in life. Several other interpretations will doubtless occur to the reader, but I am afraid that none can be profitably evaluated at this late date.

With exception of the stone-walled pit said to have underlain it, Fremont Point mound No. 1 appears to have been similar in most particulars to two larger mounds for which cross sections are figured by Brower (1899, pp. 111, 114). Both of these he calls "Harahey" burial mounds. One was near the Spring Branch village site on Kansas River, inferentially close to Manhattan; the other was at or near the Nudson village site on the Big Blue above Stockdale. Each appears to have had a sort of mantle of stone beneath its surface, and below this a fill containing burned and unburned human bones and artifacts. Included in this fill at Spring Branch mound were thirty flint arrowheads, not further described, a flint knife, fragments of a bone dagger, many shell and bird-bone beads, a spearhead, and an implement of catlinite; and Brower notes further that "exploration of several other mounds yielded similar results." Elsewhere (Brower, 1898, p. 26; pl. 9, fig. 1; pl. 25) he illustrates plain and incised tubular bone beads, shell disk beads, and small stemmed and serrate points, apparently from various sites and all reminiscent of the materials described from Fremont Point mound 1. I get the impression that the bone and shell beads, and probably also the small stemmed points, are types recurring rather frequently in and about the Kansas River valley in Riley, Geary, Pottawatomie, and Wabaunsee Counties. Whether or not they occur in lodge sites associated with Riley Cord-roughened pottery I do not know; but I have a suspicion they are perhaps mostly from an earlier period and will be found to correlate with one of the Woodland culture variants still awaiting definition in the Central Plains.

Fremont Point mound 1 materials, so far as they go, also show interesting similarities to a more extensive and varied series reported from the Younkin mound on the Republican near Junction City, about 15 miles west by south of Manhattan (Schultz and Spaulding, 1948; Spaulding, 1949, pp. 106–108). Here groups of fragmentary and occasionally burned human bones, an extended skeleton, animal bones, and artifacts were found on a rough stone floor mounded over with earth and rocks. Quantities of plain and incised tubular bone beads, shell disk beads, and small stemmed serrate points match closely the materials from Fremont Point mound 1. In addition, there was pottery, a stone platform pipe, and other material with apparent Hopewellian affinities, as well as long bone pins with expanded bases, cut human and animal bones, perforated and cut deer phalanges, and perhaps other items reminiscent of Archaic specimens. The possibility of a Hopewellian mortuary complex superimposed on a local culture not as yet defined but with Archaic affinities may be indicated. Kivett (1953, p. 134) suggests that some of the artifact types, including stemmed serrate points, shell disk beads, and incised bird-bone beads, are found in Keith Focus Woodland sites, the shell beads being especially abundant in burials of that complex. I have the impression that incised bone beads are much less common in Nebraska sites than they would seem to be, or to have been, in the burial mounds of the Big Blue-Kansas River locality; but unfortunately, neither the published record nor unpublished data at my disposal shed much light on this matter. I have a strong feeling, too, that when we know more about the archeology of the Republican River valley in Kansas, from which a good deal of promising material is in the collection of the University of Kansas Museum of Natural History, this and other thorny problems may be considerably clarified (see, e. g., Eyman, MS).

As to cultural identity of the smaller mound I have designated Fremont Point mound No. 2, little can be said. The drilled bear tooth, of course, calls to mind the frequent occurrence of drilled and otherwise worked grizzly canines, or imitations thereof, in Hopewellian sites. Since this locality lies within the demonstrated range of influence of Hopewellian culture, it is quite possible the mound in question should be assigned to a local manifestation of that culture, or to a complex influenced thereby.

### GENERAL COMMENTS ON THE MANHATTAN LOCALITY

The results of our observations in the Manhattan locality may be briefly summarized. Our data are admittedly sketchy and incomplete; but I believe they give some indication of the varied nature of the archeological remains here and may point up the potential significance of the locality for Central Plains prehistory. Surely present are ceramic materials from no less than three native culture horizons; there were probably others. These date at least as far back as the Woodland period. Hopewellian traces suggest by their nature and occurrence the presence of village or camp sites, some probably alluvium covered, as well as burial mounds. A few thick, coarsely gravel-tempered, deeply cord-impressed sherds that came to our notice were reminiscent of Woodland ware like that of the Valley or Keith Foci in Nebraska; and the marked abundance of heavy stemmed or corner-notched points in local collections would seem to imply that the Woodland and/or Hopewellian traditions may once have been strongly represented in the locality. Much more abundant and undoubtedly from a later time are the prehistoric village sites of subrectangular earth lodges, representing a semihorticultural people who made pottery of Riley Cord-roughened type. From a later people still, presumably, are the as yet very scantily represented ceramic remains with incised or trailed and punctate decoration, whose possible relationships to sites reported to have yielded catlinite objects should certainly be investigated. Such work would probably lead into the protohistoric or historic period, and might point the way to further worthwhile operations on Kansa prehistory.

With regard to the innumerable large chert implements whose cultural affiliations and period of manufacture have long been a puzzle, I have little to offer that might be helpful. We examined some of the sites described by Brower, including his "Elliott" site, and can give some confirmation to his observation that these yield little or no ceramic material. That this is proof of a preceramic industry, as Winchell argued, I am by no means convinced; but neither am I wholly satisfied at the moment that the materials can be dismissed as simply workshop debris to be correlated with the ceramic horizons known or suspected in the locality. Implements indistinguishable from forms commonly found on these largely potteryless chert sites evidently occur in local village site complexes, like the two chipped celts we recovered from house 1 at the Griffing site; but in proportion to the extraordinary numbers of pieces noted by Brower and other early-day observers, the specimens known to be from culturally identifiable village or burial sites are few indeed. There is always the possibility, of course, that the masses of chert core artifacts were roughed out forms intended for transport to distant localities, and the sites on which they predominate or occur exclusively are thus workshops. On the other hand, there has been virtually no systematic excavation in this locality; and it is possible that comprehensive investigation at earth-lodge and other village sites would show that the large chert artifacts were a regular and recurrent part of one or more local material culture complexes. With the data now at hand, I see no way of arriving at a satisfactory answer to the problems here posed.

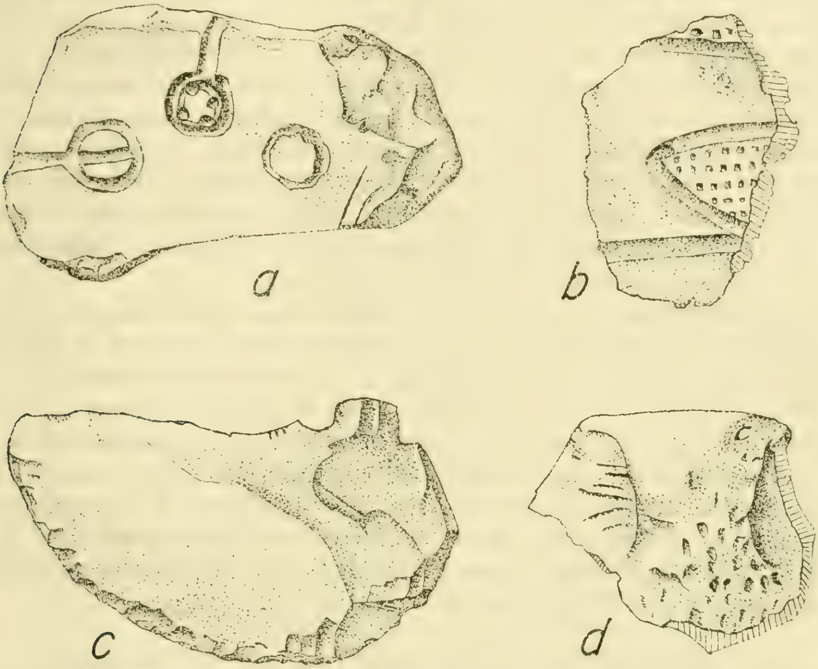

FIGURE 33.—Miscellaneous artifacts from general vicinity of Manhattan. *a*, Stone "mold" (USNM 386558); *b*, dentate stamped and zone-decorated sherd (USNM 381702); *c*, corner-tang knife (USNM 381701), Deep Creek; *d*, strap handle sherd (USNM 381697), Clark Creek.

It may be suggested that the variety of materials in the Manhattan locality reflects its strategic geographic position. The valley of Kansas River affords easy access to and from the Missouri Valley at Kansas City, where Hopewellian and other sites, both earlier and later, were once abundant; and westward it leads to central Kansas, the Republican valley, and the bison plains. The valley of the Big Blue similarly furnished a convenient and easy route of movement between the Kansas valley and southeastern Nebraska. That it has been so used for a long time is suggested by the recent investigations of the Smithsonian's River Basin Surveys in the Tuttle Creek reservoir area beginning less than 10 miles north of Manhattan. Some 119 sites of archeological interest were here recorded, and these include a variety of pottery-bearing locations, earth-lodge villages, campsites, and burial mounds. Among the latter, one with apparent Woodland affinities was excavated near the east end of Tuttle Creek dam. Indications of preceramic occupations were also reported.

All this suggests that a series of pottery-making peoples, doubtless preceded by prepottery groups, have successively occupied or passed through the locality during the past 2,000 years or more; and some of these evidently left burial mounds as well as habitation areas to mark their passage. It should be obvious that the orderly arrangement and interpretation of the archeological remains in the locality, and their correlation outside it, depends on the assembling of a great deal more controlled data and specimens than we now have at our disposal. Only then can we hope to see the prehistory of this strategic district in anything like its true perspective.

## ARCHEOLOGICAL INVESTIGATIONS IN CENTRAL KANSAS

### SITES ON LITTLE ARKANSAS RIVER, RICE COUNTY

The Little Arkansas River heads in the rolling prairie uplands of northern Rice County, and flows in a general southeasterly direction for some 80 miles to empty into the Arkansas River at Wichita (fig. 34). Throughout most of its course it carries a good flow of water, and has an attractive well-wooded valley. The hilly terrain about its headwaters soon gives place to a flat country of fertile and highly productive soils, with sandy stretches along the middle portion of the valley. Archeologically, the valley is virtually unknown, the only recorded sites of known prominence being a group of not less than four or five villages far up the river in northeastern Rice County. Two of these were tested in July and August, 1940; two others, and several pictograph locations, were briefly visited (fig. 35).

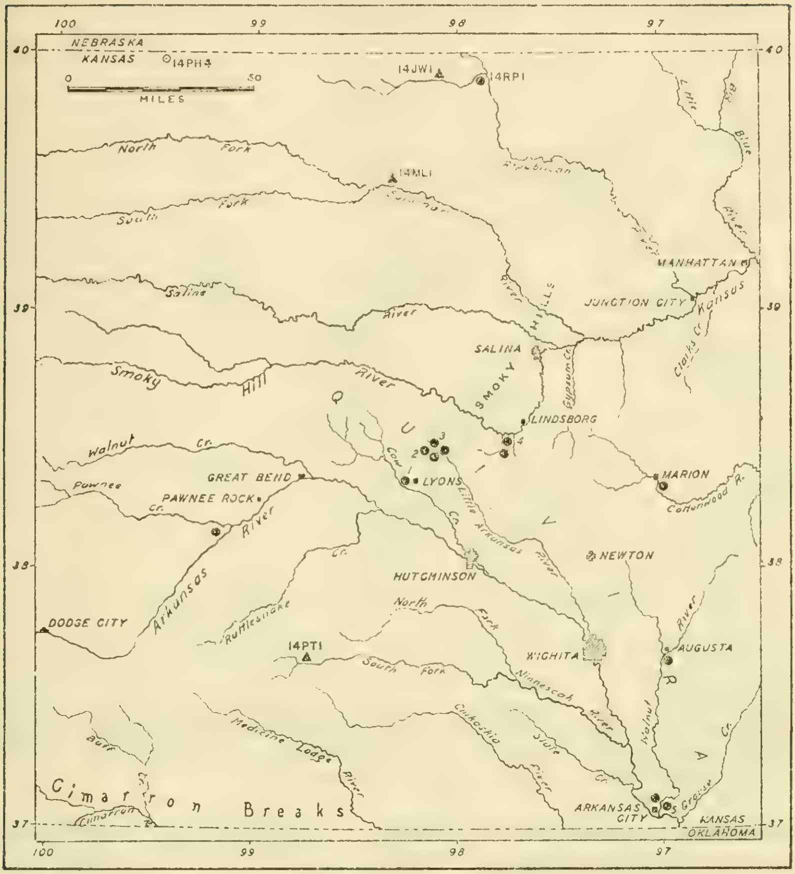
100
99
98
97
40
39
38
37
NEBRASKA
KANSAS
14PH4
0
50
MILES
14JW1
14RP1
North Fork
South Fork
14ML1
Solomon
Republican
Little Blue
Big Blue River
MANHATTAN
Kansas
JUNCTION CITY
Saline River
Smoky Hill River
SALINA
SMOKY HILLS
Gypsum Cr.
Clarks Cr.
LINDSBORG
Walnut Cr.
GREAT BEND
Pawnee Cr.
PAWNEE ROCK
Q
U
I
V
I
R
A
1
2
3
4
LYONS
Cow Cr.
Little Arkansas River
MARION
Cottonwood R.
NEWTON
Arkansas River
HUTCHINSON
Cr.
DODGE CITY
Rattlesnake
North Fork
14PT1
South Fork
WICHITA
Ninnescah River
AUGUSTA
Walnut R.
Chikaskia
Slate Cr.
Medicine Lodge River
Bluff
Cimarron Breaks
Cimarron
ARKANSAS CITY
5
Grouse Cr.
KANSAS
OKLAHOMA

FIGURE 34.—Map showing location of certain archeological sites in central Kansas. Numbered sites include: *1*, Malone site, 14RC5; *2*, Tobias site, 14RC8; *3*, Thompson site, 14RC9; *4*, Paint Creek site, 14MP1; *5*, Arkansas City Country Club site, 14CO3. Other sites shown include: 14JW1, Warne or White Rock site, Jewell County; 14ML1, Glen Elder, Mitchell County; 14RP1, Kansas Monument site, Republic County; 14PH4, Woodruff ossuary, Phillips County; 14PT1, Pratt site, Pratt County.

### THE TOBIAS SITE (14RC8)

The Tobias site, 4 miles southeast of Geneseo, occupies the summit of a broad grassy ridge on the right bank of Little Arkansas River (fig. 36). Southward, the ridge rises gradually to merge into the rolling uplands which form the Little Arkansas-Cow Creek watershed; on the west, it is flanked by a wide shallow swale, beyond which is another grassy knoll without visible archeological remains. At its north end, the ridge drops away in a broken sandstone bluff to the bottoms of the Little Arkansas, here only an intermittent creek today. The stream curves away from the bluff toward the northeast, turns briefly toward the south past other sandstone outcrops, and then

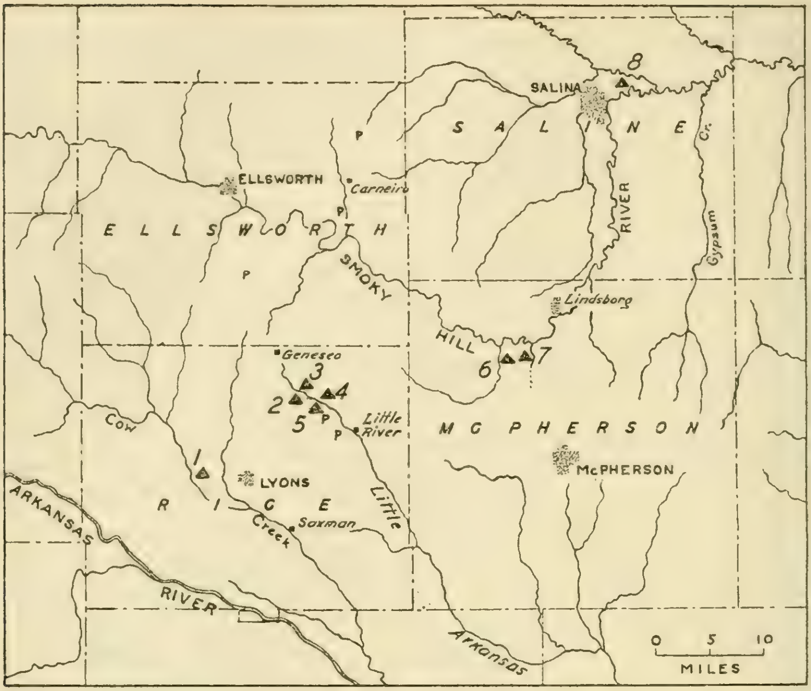
8
SALINA
S A L I N E
Cr.
Gypsum
ELLSWORTH
Carneiro
P
E L L S W O R T H
SMOKY
HILL
RIVER
Lindsborg
Geneseo
3
4
2
5
P
Little River
M C P H E R S O N
6
7
COW
1
McPHERSON
LYONS
R I C E
Creek
Saxman
Little
ARKANSAS
RIVER
Arkansas
0 5 10
MILES

FIGURE 35.—Map showing location of certain archeological sites in and near Rice County. Numbered sites: *1*, Malone, 14RC5; *2*, Tobias, 14RC8; *3*, Thompson, 14RC9; *4*, Major, 14RC2; *5*, Hayes, 14RC3; *6*, Swenson site, on Sharps Creek; *7*, Paint Creek, 14MP1: *8*, Whiteford site 14SA1. Petroglyph localities indicated by *P*.

leaves the site in an easterly direction. Upstream, there is little or no live water, but several springs issue from the base of the sandstone outcrops and from these there is a trickle of water and an occasional small pool below the site. The wooded bottoms in the bend northeast of the ridge represent the present upper limit of heavy timber on the stream, with cottonwood, elm, walnut, ash, hackberry, locust, and other hardwoods growing to considerable size. The uplands are treeless, but in short ravines and "breaks" near the site may be seen chokecherry, elderberry, wild plum, wild grape, mulberry, and Osage orange. The ridge occupied by the site was still in sod at time of our investigations; besides native grasses, it bore an abundance of prickly pear cactus and a few yucca. Of the original fauna almost nothing remains save rabbits and other small rodents, but noteworthy is the fact that we identified the rare upland plover several times in the immediate vicinity.

The visible archeological remains on the site (pl. 21, *a*) consist chiefly of 19 low inconspicuous mounds, among which are innumerable small depressions marking the location of subterranean cache pits. The area occupied by these features measures roughly 600 yards from north to south along the ridge top by about 200 yards. The

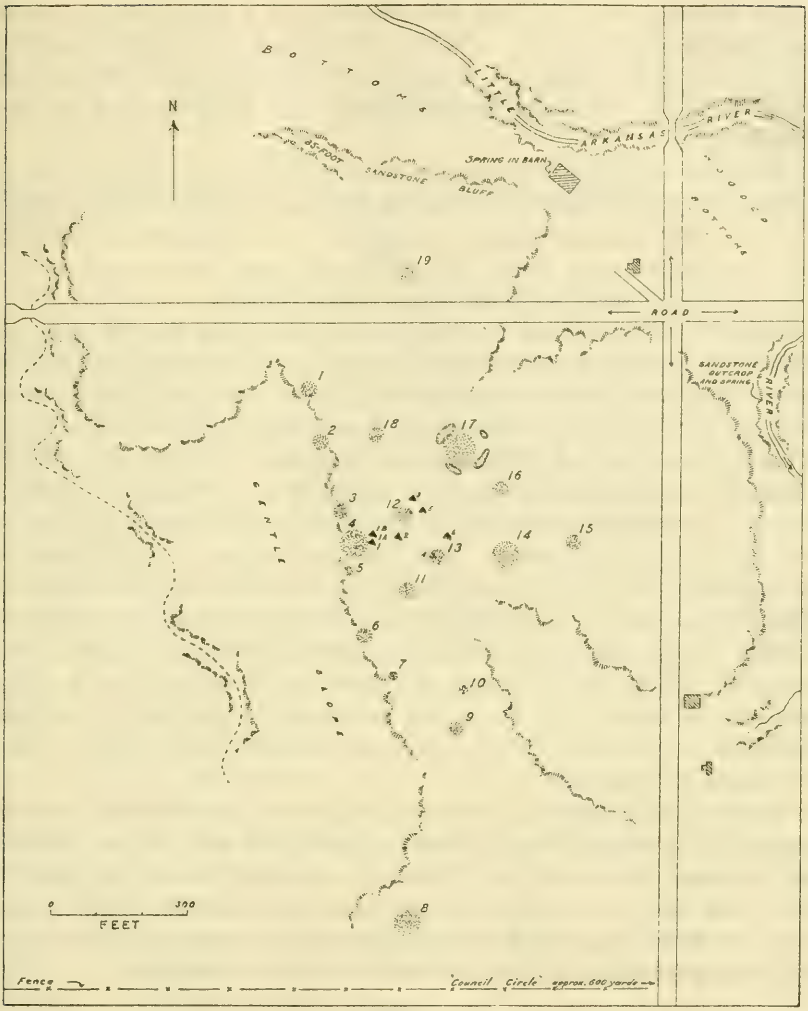
N
BOTTOMS
LITTLE
ARKANSAS
RIVER
85-FOOT SANDSTONE BLUFF
SPRING IN BARN
BOTTOMS
ROAD
SANDSTONE OUTCROP AND SPRING
RIVER
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
0
300
FEET
Fence
"Council Circle" approx. 600 yards

FIGURE 36.—Sketch map of portion of Tobias site, 14RC8, in Rice County, showing refuse mounds (stippling), excavated cache pits (numbered triangles), and other features.

mounds range in diameter from 25 to 40 feet or slightly more, and none exceeds 2 feet in height. All had been dug into before we began our work, and the old diggings were readily recognized by their rank growth of bull thistle, Mexican poppy, and other weeds. Aside from this adventive growth, the grass cover on the slightly elevated better drained mounds showed a tendency to wilt sooner in the dry heat of midsummer than did the grass elsewhere on the site; conversely, in the cache depressions the cover retained its lush green character in spite of dry weather. Of somewhat unusual character, as will become evident from our discussion elsewhere, is one of the larger mounds, No. 17, lying near the head of a draw opening northeastward to the bottoms. This is surrounded at irregular intervals by pits of unequal size and depth, the whole forming a curious complex to which the term "council-circle" has been applied by local collectors.

Artifacts are almost impossible to find in the tight sod cover on the ridge. The cultivated fields lying to the south, however, when freshly plowed yield chipped stone, potsherds, bone fragments, and other detritus after every rain. This suggests that the actual area of habitation may once have been appreciably larger.

It is possible, too, that the village once extended farther east, well beyond the existing north-south county road. In this direction, approximately 400 yards from the main site ridge, is a grassy knoll bearing on its summit another large depressed ring or "council-circle." This is better marked than that on the Tobias site proper. The depressed portion averages perhaps 10 to 12 feet (3 paces) wide and a foot or less in maximum depth, with an outside diameter of approximately 25 yards (32 paces). The ditch, unlike that on the Tobias site, is continuous or nearly so; it is deepest and widest on the southwest. The central part seems to have been mounded to a height of approximately 2 feet. Large sandstone boulders protrude from the ground here and there. No artifacts or other certain evidence of a village were found about this ring, but sandstone ledges along the Little Arkansas a hundred and fifty yards or so to the east still bear traces of simple pictographs.

There is no apparent order or regularity in the distribution of the mounds (fig. 36), although most of them lie to one side or the other of the crest of the ridge. Seven are situated in an irregular line along the west rim, overlooking the gentle even descent to a dry wash. Two of these, with sizable areas showing no recent disturbance by digging, were selected for examination by cross trenching.

### MOUND 4

Superficially one of the larger mounds of the site, this lay about 160 yards south of the east-west road across the ridge. It had been partially dug over, but we opened a 35-by-3-foot trench running in an east-west direction. Results were disappointing. The mound fill was mainly a dark-gray soil, streaked here and there by thin seams of ash, with potsherds, animal bones, flint chips, stones, and similar refuse present in limited amount. Most of the artifacts and cultural debris occurred in the upper portions of the mound, diminishing in frequency from the grass roots downward; few specimens were found at more than a 15-inch depth, and subsoil was encountered at 18 to 20 inches below the crest of the mound. At the extreme west end of the trench, 6 inches below the surface, was a pocket of white wood ashes 6 inches thick by 16 inches across. Near the east end beneath the east slope of the mound, a rather vaguely defined basin filled with light ashy soil reached a maximum depth of nearly 3 feet and a diameter of about 4 feet. There was nothing in the composition of the fill or in the all but featureless nature of the underlying ground surface to suggest that the mound was anything other than a midden accumulation.

### MOUND 6

This mound, situated about 70 yards south of the preceding and, like it, at the top of the slope, differed chiefly in its somewhat higher yield of cultural material. From the grass roots to a depth of approximately 12 inches the soil was mixed with ashes, charcoal, broken pottery, flint implements and chips, stones, animal bones, and other refuse. The surface of the underlying ground showed only an occasional small shallow pit or basin with slightly heavier artifact yield; no hearths or cache pits were recognized, nor was there any evidence of postmolds.

If the findings briefly summarized above can be taken as indicative, mounds 4 and 6 are undoubtedly refuse accumulations. Probably most or all of the remaining mounds on the site, with the exception of No. 17, have a similar origin. There seems not the slightest evidence to support a widely held local view that they represent houses, and it may be concluded that the habitations were situated elsewhere on the ridge among the mounds. Of these no trace is now visible unless perhaps in some of the larger depressions scattered over the site. It is possible that by carefully stripping the surface between some of the middens, postmolds, hearths, and other features attributable to house structures could be recognized. In our brief survey, however, no such work was possible, and we can offer no direct evidence in support of our surmise that surface or at most shallow subsurface dwellings were in use.

### MOUND 17

This interesting complex, as previously noted, showed on the surface as a mound surrounded at irregular intervals by a ring of shallow pits (fig. 37). It lay slightly to the north and east of the main mound group on the widest portion of the ridge. The mounded area was approximately circular, with a diameter of 60 to 70 feet. At its highest point the mound rose a scant 18 to 20 inches above the surrounding general hilltop. Lying just beyond the mound edges, were four, and possibly five, elliptical or oval basins. The largest of these, on the north, was approximately 10 feet wide, 45 feet long, and 1 foot deep; the others were smaller and slightly shallower. All save that on the west were devoid of grass, and the bottoms were

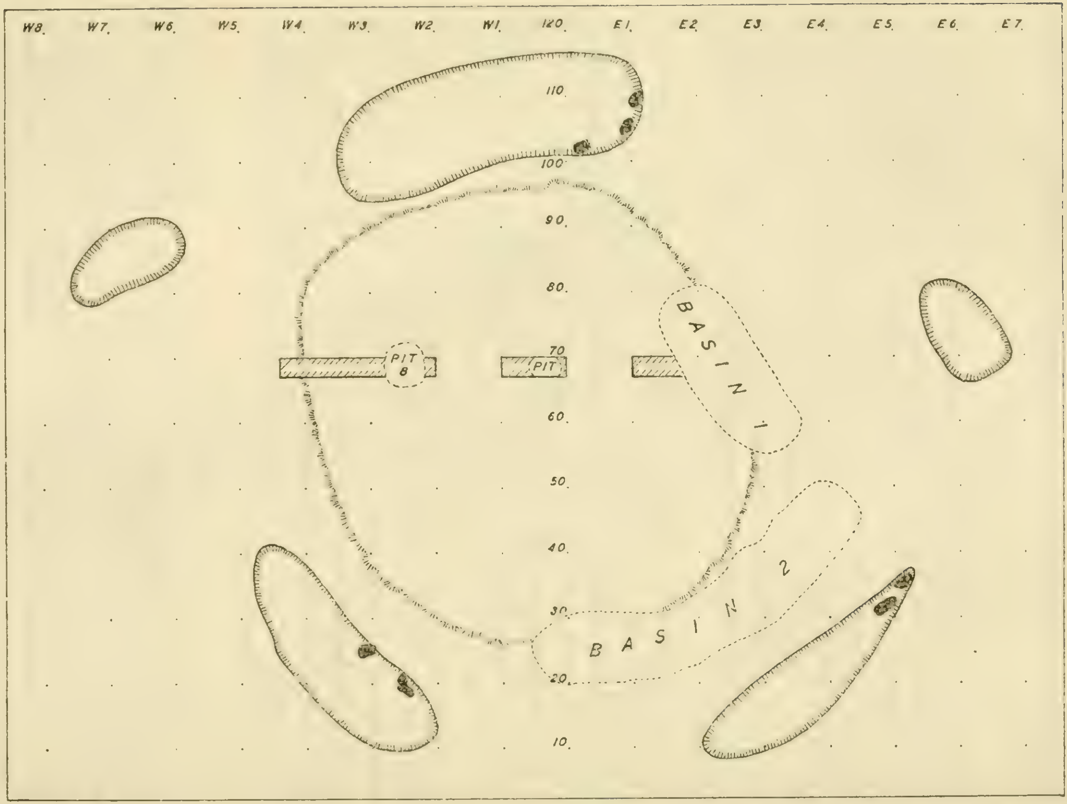
W8.
W7.
W6.
W5.
W4.
W3.
W2.
W1.
120.
E1.
E2.
E3.
E4.
E5.
E6.
E7.
110.
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
PIT 8
PIT
BASIN 1
BASIN 2

FIGURE 37.—Plan of mound 17 and associated features, showing location of initial test trench (diagonal shading). Rayed ellipses indicate surface depressions (borrow pits); solid shading, sandstone boulders visible on surface; broken lines, basins 1 and 2 as excavated. Grid in 10-foot squares.

puddled by the tramping of livestock during wet periods. The three largest of these basins each had two or three large unworked sandstone boulders, evidently carried to the spot from the ledges at the north or northeast margins of the ridge. Borings to depths of 4 feet in the southwest and southeast basins yielded no trace whatever of cultural material or of disturbed formations underlying the basins. The general relationship of these several surface features to each other is shown in figure 37.

The area encircled by the basins was staked out in 10-foot squares, with a base line 100 feet long running along the north-south axis through the highest point of the mound. At right angles to this was a secondary base line, which crossed the first at stake 70. Excavations began along the south side of line 70 as a series of pits 10 feet long by 5 feet wide in alternate squares along the east-west base line (pl. 21, *b*, *c*).

The upper 6 inches of soil contained relatively little admixture, though a few artifacts such as sherds and flints came to light. From 6 inches to approximately 15 inches the soil continued dark in color, with streaks and pockets of wood ashes, animal bones, mussel shells, worked flint and bones, and potsherds. Below 15 or 18 inches, there were no cultural remains except where aboriginal man had excavated cache pits or other features; and it was concluded that this level represented the original prairie surface on which the mound was erected. The earth to a depth of 10 or 12 inches more was quite dark, indicating that there had been no effort to remove the humus topsoil before mound deposition began. Light-colored subsoil lay at a depth of approximately 26 to 29 inches below mound surface, or approximately 10 or 12 inches below the old premound prairie sod line. Thus, the central tumulus in the mound-17 complex seems to have differed only in its greater areal extent from the other middens on the site as exemplified in mounds 4 and 6.

It is apparent, however, that the midden was not the first man-made feature to occupy this particular spot. The test trench in square 60 (see fig. 37) disclosed clear evidence of a circular cache pit 45 inches deep underlying the mound fill. At the premound surface this had a diameter of 48 inches, whence the side walls widened to a maximum diameter at the floor of 58 inches. Charcoal lumps and lenses, and worked materials clearly distinguished the pit fill from the surrounding undisturbed soil formations, but the contained artifacts did not differ from those characteristic of the site generally. Immediately west of this cache pit, also on the old premound surface, was a shallow fire basin filled with gray ash and charred sticks.

Farther west, in square 60 W 2, another pit—or, more properly, two intersecting pits—were encountered. Their relation to the mound is not quite clear, but it appears that the upper 18 inches of pit fill was indistinguishable from the mound material on either side. This would suggest that the pits are older and had been buried beneath the later midden deposits. The first of these pits, No. 8, was circular and vertical-walled, with a depth from the present surface of 87 inches, and a diameter of 72 inches. Assuming an 18-inch overburden of mound material, the original depth of the pit was in the neighborhood of 70 inches. It was filled with dark-brown soil mixed with charcoal, burnt earth, and artifacts. Ash lenses were scattered through the fill at several levels, presumably representing the periodic cleaning of some nearby ancient firepit. A layer of broken limestone pebbles, perhaps used for cooking, lay in the north part of the pit at a depth of 30 inches underground; and this was found to extend northward beyond the pit wall for some distance. Without question, I think, these belong in the intersecting later cache which cut the north wall of pit 8, and partially overlapped it. This second pit, 8A, measured 60 inches in diameter at the premound surface, with a total depth from the present surface of 77 inches (i. e., 60 inches from premound surface).

A few feet west of pits 8 and 8A, at or very near the mound edge in square 60 W 3, the test trench exposed a disorderly mass of large sandstone boulders, partially filling an ash-floored basin. Vertically, they occurred between 5 and 18 inches underground. Their removal disclosed two small scraps of human bone at a depth of approximately 12 inches. Of particular interest was the finding at 11-inch depth among these boulders of a Late Chupadero Black-on-White potsherd (USNM 389024). At the west end of our cut, in square 60 W 4, the soil profile showed only a faint scattering of charcoal and other debris in the topmost few inches of topsoil. Test borings to a depth of 3 feet yet farther from the mound center gave negative results.

In square 60 E 2 the digging was much more productive. The upper 12 inches consisted of a very dark nearly black soil heavily impregnated with sandstone fragments, flint chips, animal bone, and potsherds. Underlying this was a 6-inch stratum of nearly sterile gray earth with occasional traces of wood ash. At the east end of the square, 18 to 24 inches deep, were found human vertebrae, ribs, and skull fragments (pl. 22). Some of the fragments were scorched and fire blackened; with them were intermingled lumps of burned clay and charred twigs. At a depth of 24 inches was found an unscorched bison skull, and west of this were sandstone boulders apparently placed in purposeful fashion along a line cutting our excavations at a right angle. At a well-defined point very near these boulders in square 60 E 2 it was found that the refuse-bearing formation dropped abruptly from 18 inches on the west to a depth of 30 to 33 inches on the east. This led to a lengthening and widening of our test trench by the removal of all mixed and disturbed earth and ultimately to the delineation of a feature designated from its shape and conformation as basin 1 (fig. 38).

### BASIN 1

Basin 1 was an elliptical straight-sided vertical-walled pit 30 feet long by 12 feet wide, with its long axis trending northwest-southeast (pl. 24, *a*). The floor lay at a depth of 36 inches, but along the midline further tests revealed almost 12 inches more of finely laminated nearly sterile siltlike material before undisturbed subsoil was reached. This suggests that the original depth of the basin was nearly 48 inches, and

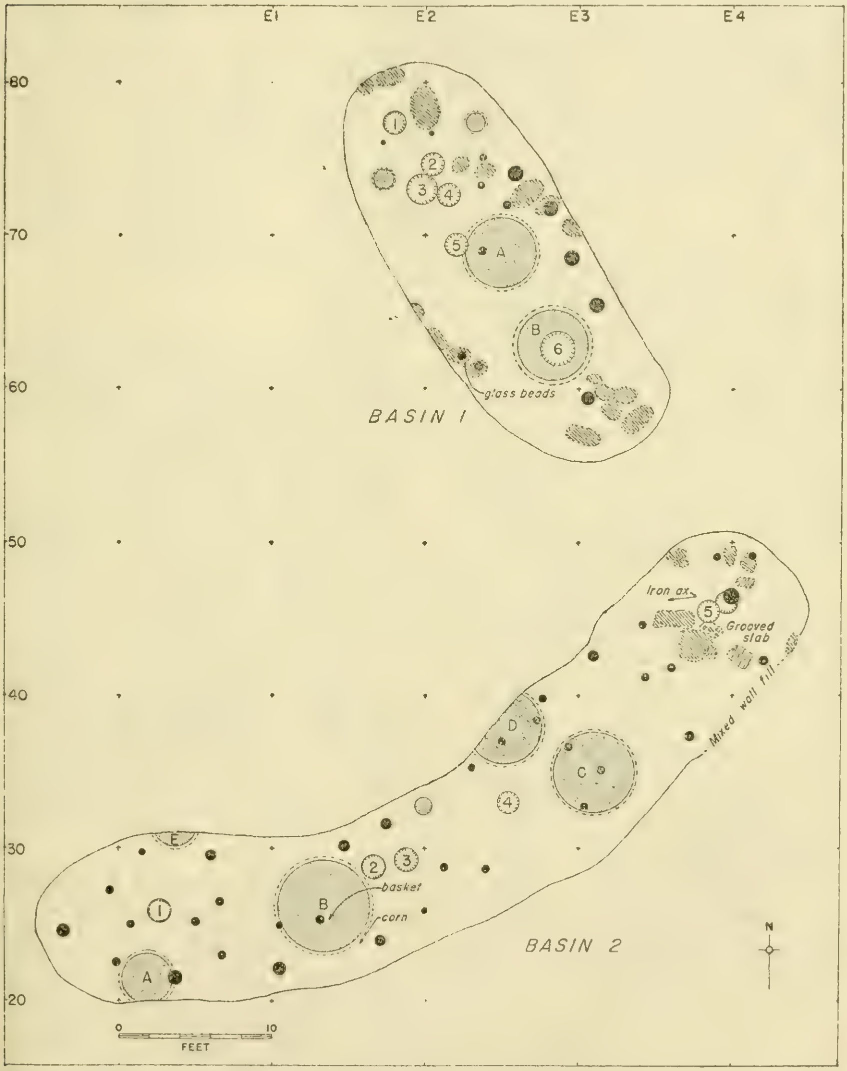
E1
E2
E3
E4
80
70
60
50
40
30
20
A
B
C
D
E
1
2
3
4
5
6
glass beads
BASIN 1
Iron ax
Grooved slab
Mixed wall fill
basket
corn
BASIN 2
N
0
10
FEET

FIGURE 38.—Plan of excavations in basins 1 and 2, mound 17 complex, Tobias site. Cache pits indicated by stippling and lettered circles, fireplaces by rayed and numbered circles, sandstone boulders by irregular diagonally shaded areas, postholes by solid circles. Grid in 10-foot squares.

that the concave floor had been either renewed periodically by the natives or else that windblown material settling perhaps in ponded rainwater had gradually raised the level. The walls as finally determined were clearly and unmistakably marked, with refuse-bearing formations inside the basin contrasting strongly with the completely sterile and undisturbed soil outside (fig. 38).

Within the basin, the upper 6 to 10 inches were of dark-gray soil containing some humus sparingly mixed with sherds, charcoal, and flints. Below this, to a depth of 18 or 20 inches, was lighter colored fill containing somewhat larger quantities of refuse. Large and small sandstone boulders, none of them dressed or in any way modified by man, occurred throughout all of these upper zones, though only one was visible near the extreme northern end of the basin prior to its excavation. These boulders were scattered chiefly near the northern and again toward the southern end, with a small cluster against the west wall; many showed a slight dip toward the center of the basin, as though thrown into a partially filled pit or fallen into a loosely filled area which subsequently settled.

Below the boulder-filled stratum was an 8- to 12-inch layer containing numerous scattered, often fragmentary, and mostly disarticulated human bones, broken animal bones, charcoal, burnt sticks, sherds, and miscellaneous bone and stone artifacts of rather considerable interest. A scrap of iron and a double-pointed iron awl (USNM 388848) were taken from this bone horizon near the north end. Underlying the bone bed, below a depth of about 26 to 29 inches, the soil was heavily mixed with charcoal fragments, lumps of burnt grass-impressed clay, potsherds, and other cast-off materials, but with few bones or rocks. Lying on or very near the floor, at depths of 32 to 39 inches and mostly in the north half of the basin, were a fine blade of banded chert (pl. 46), several blue glass beads, a rolled copper bead, and some very well-made bone points. Near the charred upright stump of a post not far from the southwest wall lay a mass of blue glass, bird bone, and turquoise beads (USNM 388846), undoubtedly the remains of a necklace (see pl. 25, *b*). Masses of charred twigs and similar small material covered large portions of the floor.

The floor of the basin, when completely cleared, revealed a number of interesting features. Scattered irregularly along or near the midline were 6 hearths, 5 of them in the northwest half and 1 in the southeast. These were simple unlined circular basins ranging from 16 to 28 inches in diameter, and containing from 2 to 10 inches of white wood ashes and charred twigs; most were underlain by a thin line of burned earth. Hearth No. 3 partially overlay No. 2, and thus was evidently of later origin; otherwise, there is no evidence that any great time interval separated the periods of use of the various fire basins.

Along the northeast side, about a foot from the basin wall, were found four postmolds 10 to 15 inches in diameter and 15 to 20 inches deep. They were filled with soft earth containing charcoal, rubbish, and, in one instance, unburned but partially decayed wood. Nine other smaller holes, also filled with rubbish and decayed wood, were scattered about the basin without any semblance of order, and were identified as postmolds.

About a foot from the west wall of the basin was a small pocket cache 17 inches deep, with a diameter of 11 inches at the top and 14 inches at the floor. Traces of a charred grass lining were noted. Inside were over 300 worked and unworked flints, several scrapers, a small mortar, a notched blade, two mussel shells, and a charred corncob. A similar small subfloor cache directly across the basin near the northeast wall was 19 inches deep, with a top diameter of 15 inches and bottom diameter of 19 inches. It contained a few flint chips, broken bison bones, a sherd, and several charred corncobs.

In addition to the foregoing features, all unquestionably directly associated with some sort of structure formerly occupying the basin, there was evidence also of activities on the spot possibly before and certainly after the basin was in use. Very close to the center of the basin, beneath a burned floor line littered with charred twigs, was a circular pit averaging 50 inches in diameter at the top by 30 inches deep, with a grass-covered floor 60 by 55 inches in diameter. From the hard-packed ash-streaked fill in this pit (fig. 38, *A*), came very little material, but on its floor were found fragments of bison skull and other bones, a few sherds, and flints. A postmold probably associated with the basin structure intruded the west half of the pit. Midway between pit A and the southeast end of the basin, centered directly under hearth 6, was a second pit (fig. 38, *B*). This measured 57 inches across the top, 64 inches across the bottom, and was 19 inches deep; the bottom was lined with charred joint grass. The fill was heavily mixed with ash, burned earth, potsherds, flints, stones, and animal bones, including remains of two bison legs evidently placed in the pit in articulation. Pits A and B were evidently abandoned before basin 1 was given up, and it is possible that they were dug and then filled in before the basin was excavated. However, their placement within the basin suggests planning, and the apparent careful centering of hearth 6 over pit A does not suggest a mere coincidence. More likely, perhaps, is the suggestion that both were in use during the early period of use of the basin, and that they were filled up and sealed over by the floor at a later time while the basin was still in use.

At the northwest end of the basin, the charred twig layer on the floor ended abruptly in a curving line, and the basin wall showed black ashy fill from ground surface to basin floor. Within this formation, there was no trace of human bones, though the immediately contiguous basin fill held many. This disturbance, clearly extending well beyond and probably below the basin limits, was not worked out, but it seems a safe inference that a cache pit had been dug and later filled with refuse after the nearby partly intruded basin was abandoned and filled up.

A second area of disturbance lay at the southeast end of the basin. This, apparently did not extend below floor level, but the entire wall for a distance of 7 feet showed traces of charcoal, ash, and other midden material. The basin border at this point, therefore, is somewhat uncertain; as shown in figure 38, it is based partly on projection of the wall curvature at either side and partly on the more compact character of the midden fill outside the reconstructed basin boundary. Possibly this represents an old prebasin refuse deposit, but since excavation was not attempted no final determination can be made.

### BASIN 2

Tests a few yards south of basin 1, in the southeast quadrant of the "council-circle," disclosed burnt material, stones, charred wood, a human clavicle, and two mealing stones at a depth of about 28 inches. Our initial test, in the southeast corner of square 30 E 3 was enlarged in the same manner as was the discovery pit in basin 1—by the simple process of removing all mixed soil until clean subsoil was found. This resulted in the delineation of a second basin, much larger, more complex, and richer in both cultural debris and data than the preceding basin. Its location in relation to basin 1 is shown in figure 38.

Basin 2, measured along its midline, had a total length of 58 feet, and a width ranging from 10 to 12 feet. Its outline can be described best as curving, sausage-shaped, with rounded ends (pl. 24, *b*). Its long axis lay from northeast to southwest. The fill, generally speaking, resembled that in basin 1, though with noteworthy differences. The dark-gray humus topsoil, as probably everywhere on the site, contained very little cultural admixture. Below this, to about 18 or 20 inches, was a light-gray soil with some rocks, charcoal, etc. From 18 inches to the basin floor at 32 to 35 inches, was a dark carbonaceous earth containing masses of burnt clay, often grass or pole impressed, an abundance of charcoal ranging from small twigs to pieces nearly 6 inches in diameter, sherds, flints, bones, and artifacts. Unlike basin 1, this second basin yielded almost no human skeletal remains. Large sandstone boulders occurred in jumbled masses near each end of the basin. In both places, they were usually tilted downward toward the center of the basin as if they had slipped into a collapsing house structure or into a partly filled depression. This dip toward the basin was particularly striking at the southwest end where most of the boulders formed an imbricate layer from just below sod line nearly to the floor. Two or three bore grinding and sharpening grooves, but most were unmodified. Below and among these occurred many lumps of baked clay 2 to 3 inches thick with pole impressions on one surface. Small charred twigs and timbers from 1 to 2 inches in diameter occurred in particular abundance on the floor along the north and northwest wall.

At a depth of about 32 inches was found what appears to have been a floor level. Five hearths were found here, all at or near the midline of the basin; No. 1 lay about 8 feet from the west end, No. 5 about 4½ feet from the northeast end, and the other three in the middle part of the basin. Each was shallow, circular in outline, filled with wood ashes and charred stick fragments, and rimmed and underlain by burnt earth. The diameter varied from 15 to 22 inches, and the depth of ash from 2 to 4 inches. Around each the floor was hard packed and well defined. Nos. 2 and 5 were covered with hard packed floor, and probably were not from the latest occupation. Just south of hearth 5, on the floor, lay a sandstone slab crisscrossed with sharpening grooves; 2 feet west, at a depth of 30 inches, lay a heavily oxidized iron ax blade broken through the eye.

Scattered around the edge of the floor, usually within one or two feet of the wall base, were discolored spots from 5 to 12 inches across. Excavation revealed that they were filled with trash, and extended to depth of 6 to 23 inches. Many contained charcoal, and in several instances it was noted that these fragments stood upright at various depths in the hole. About 4 feet west of hearth 6, and again 2 feet east of hearth 3, the charred remains of upright posts 4 to 6 inches in diameter, were found still standing in the holes, and some of the larger molds along the east and southeast wall contained quantities of unburnt finely powdered wood undoubtedly representing decaying posts. Five feet southwest of hearth 2 was another post, charred to height of 6 inches above floor and traced as rotted wood to depth of over 18 inches. It had been wedged tightly by a crude maul and several upright legbones of the bison. Near the postholes along the north side at the west end, were found sizable fragments of timbers and knots which still gave off a strong and unmistakable odor of juniper. There can be no reasonable doubt that the holes cleared at the edge of the floor, and probably those found at irregular intervals along the midline of the basin, were postmolds which once carried some sort of wooden, clay-daubed superstructure.

In the central section of the basin, close to the north wall, was a small pocket cache, measuring 18 inches across the top, 25 inches across the bottom, and 19 inches deep. The upper portion of the fill contained some ash and a 2-inch layer of charred twigs; below was very dark earth and lumps of burnt clay. From the fill came several redware sherds, a tubular bone bead, and flint chips.

During the search for additional postmolds and other subfloor features it was found that basin 2, like basin 1, apparently had more than one floor level. This was revealed particularly well in the northeast part. At this point there were no less than three floor lines, at depths of 32, 33½, and 35 inches. A firepit 2 inches deep dug from the 35-inch floor had been used for a short time when the floor was raised to 33½ inches, then was filled in and replaced with another hearth about 3 inches deep and lying slightly to one side but partly overlapping the first. Ultimately, the second hearth was filled up and covered over entirely by the 32-inch floor. A shattered pottery vessel lay scattered over the buried hearths on the topmost 32-inch floor level. To what extent this practice of renewing the floor level and hearths was general over the basin is not clear; but the materials found sparingly below the topmost floor were identical in type with those noted from the upper floor.

Again as in basin 1, the excavation of postmolds and other features penetrating the floor disclosed the presence of several large subfloor cache pits. In the extreme southwest part was pit A; owing to an oversight my notes contain no data regarding its dimensions though it appears to have been about 3 feet in diameter and lay just within the basin limits. Pit B lay immediately southwest of hearth 2; it was 66 inches across at the basin floor level, 78 inches across the bottom, and 48 inches deep. The pit bottom was flat and covered with charred grass. A foot above the floor was a bison skull fragment, and just below were numerous fragments of a pot. Bison scapulae and fragments, flint artifacts, and redware sherds were also in the fill. Pit C lay east of hearth 4, in the northeast half of the basin and corresponding in placement to B in the southwest half. It was 68 inches across the top, 70 inches across the bottom, and 46 inches deep. From the ash-streaked charcoal-laden black fill came a circular perforated shell pendant, several bone awls, potsherds, and a bison skull complete save for the lower jaw. Pit D was immediately northwest of C, slightly more than half of it lying within the basin and its narrow neck traceable in the basin wall to the present ground surface. The diameter at ground surface was 53 inches, which diameter held to a depth of 48 inches. At this point the walls flared outward to give a bottom diameter of 76 inches, and a total depth of 76 inches. The fill contained a great deal of wood ash, together with the usual limited amounts of pottery fragments, flints, bones, and similar debris. The floor of the basin extended unbroken over pit D, and the latter was unquestionably used and abandoned before the basin was dug. A fifth cache pit, also intruded by the basin, lay in and under the north wall of the basin near the west end, opposite pit A. This appears to have been not over 3 feet in diameter; its depth and full dimensions were not determined. From it, during backfilling operations, came a muller, mealing slab, and a well-made grooved maul.

As to the time relationships of the five pits just described, it is clear that D and E, at least, preceded the construction of the basin and had no direct connection with it. Pit A may have been a part of the basin complex, as it lay between two of the supporting postmolds, and was not found until the search for postmolds began. Pits B and C were either earlier in time than the basin, or else were a part of it at some time during its use. The presence of intrusive postmolds would indicate that the basin was covered over with some sort of structure and was probably inhabited after these pits fell into disuse. This view is also supported by the discovery of a charred basket, shelled corn, and other artifacts over pit B but on the general basin floor level. On the other hand, the careful centering of pits B and C at or very near the basin midline and in such position that they divided the basin longitudinally into three nearly equal parts, strongly suggests that they were dug after the basin was originally outlined. Whereas the basin was probably occupied for some time, or was reoccupied several times after short periods of abandonment, pits B and C may have fallen into disuse during later occupations, been filled in, and had posts set into their leveled and hard-packed floor level surfaces. I doubt that prebasin pits would happen to occur in such careful positioning by chance alone. In short, pit A is doubtful; B and C were probably part of the basin 2 complex at one of its earlier occupation periods, less probably represent the bottoms of prebasin caches; and D and E were unquestionably of prebasin date. It is to be noted that the pottery and other cultural material from all pits cleared or tested in connection with basin 2 were of the same type as that in the basin proper so that no very great time lapse, extraneous populational increment, or marked developmental succession can be inferred.

The artifacts and other antiquities from basin 2 will be described fully in another place, but in view of the somewhat perplexing character of the structure from which they came, a few general remarks concerning their nature and occurrence may not be inappropriate at this point (pls. 23, 25). Particularly noteworthy was the presence of quantities of charred corn, both shelled and on the cob; most of it was scattered over the floor in the central part of the basin (pl. 23, *b;* 25, *d*). Perhaps a half peck of shelled corn lay in a pile just above the southeast edge of pit B. Two or three feet to the northwest was an overturned basket (USNM 388977), which may once have held the corn (pl. 25, *c*). Littering the floor north and west of hearth 3 were a score or more of mussel shells, some stained with red ocher, some nested, one containing ocher and a scrap of oxidized iron (pl. 25, *a*). Notched and beveled knives, other flints, a bone awl, and corn lay among the shells. Near the pile of corn mentioned was a bundle of half a dozen willow rods averaging one-fourth of an inch in diameter, 18 to 20 inches long, and with one end pointed as from diagonal cutting. There were several mullers, mortars, and mealing slab fragments, and three complete pipes nearby. From the burned earth above the floor came several dozen large chipped "pipe-drills" of chert, and in or just above this same formation were no less than six fragmentary bison skulls. All of this material would seem to indicate ordinary household or domestic activities, but the disorderly manner of occurrence and the presence of many unbroken objects further suggest hasty abandonment by the individuals who used it. Almost without exception, too, the artifacts are blackened, discolored, cracked, or otherwise show clearly the effects of exposure to fire. There is to be noted, finally, the fact that parts of human skeletons, mostly limbs of subadults, with the bones of the hands and feet still in correct anatomical alinement, lay on the floor above and near pit B.

Around most of its periphery, except where earlier caches were encountered, the wall of basin 2 was defined with little difficulty. At the northeast end, however, this boundary is open to doubt. Some discoloration was seen in the rounded end, and a rather strong admixture occurred on the southeast side of the basin just short of the end curve. As figured, the basin shape here was determined by clearing out only the fill containing masses of burnt wattling clay and charred sticks and poles. It is possible that further examination would disclose another sizable midden area or a cache pit group outside the basin, or even that basin 2 would connect with basin 1. At the same time, I feel reasonably certain that the basin as drawn in figure 38, represents a distinct unit which existed at one time, whether or not in earlier or later periods it connected with basin 1 or with other extraneous features. For this reason, I believe we are justified in viewing the two basins as separate and distinct structural units, regardless of some possible connection or mutual participation at one time in a still larger complex.

### General Comments

As to the true significance of our findings in basins 1 and 2, aside from the artifacts, I must confess to considerable uncertainty. That posts once stood in most or all the spots I have designated postmolds, and perhaps also in others whose location may have escaped detection, seems indisputable, since a number of these molds in basin 2 still contained short upright lengths of charred wood at the floor level and quantities of rotting unburned wood dust in their subfloor portions. The centrally situated ash-filled fireplaces and inclusive caches likewise argue for a domestic occupation. It appears reasonable to infer further that the upright posts once supported a pole and thatch structure partially or wholly covered on the outside with clay or mud daub. I can think of no equally plausible explanation for the conditions noted in basin 2, where charred grass, twigs, and fragments of poles up to 3 inches in diameter lay on the floor with masses of burnt clay among and especially above this material. Much of this burned clay, as previously noted, bore the unmistakable imprint of grass thatch and small twigs. Just above the floor between pit C and hearth 5 lay three parallel sections of 1½- to 3-inch poles, about 9 inches apart, and associated closely with burnt clay wattling. Another mass of clay showed a series of closely laid parallel rods held in position by a heavy twined weft element. The burnt clay, it may be noted, rivaled in quantity that found in the semisubterranean pithouses of northern Kansas and Nebraska, where earth-covered dwellings existed in historic, and undoubtedly also in prehistoric, times. I know of no previous find, however, in the Plains or elsewhere, of an elongate curved structure of the form indicated by our work in basin 2.

There can be little doubt, I think, that the structure in basin 2 was destroyed by conflagration; the masses of fire-hardened clay, the charred poles, grass and post remains, the scorched appearance of the artifacts and other durable materials, and their disordered occurrence all point to such an end. It is highly improbable that the many small objects we recovered from the floor, including unbroken pipes, stone knives, drills, mussel-shell containers, corn, etc. would have been left lying thus about the house while the occupants performed their daily tasks. It seems far more likely that most of these items had been cached in the thatch or otherwise stored off the floor out of harm's way; the bison skulls found here and there above the presumed wattling clay may once have reposed on the roof, in good Plains Indian fashion. The disarray in which we found this material was the result, without much question, of misfortune; whether this stemmed from an enemy raid or was accidental there is, of course, no way of saying. Basin 1 showed comparatively little evidence of burning; whether the structure therein was destroyed before, simultaneously with, or after that in basin 2 remains conjectural.

The sandstone boulders in the fill of both basins presumably had been piled originally against the upper walls from the outside, and slid into the depressions when the buildings collapsed. It was apparently at this stage in the sequence of events that basin 1 was briefly utilized as an ossuary, and received the disarticulated remains of corpses previously exposed to the elements. I doubt that the basins were dug expressly or primarily for purposes of burial, for the bones were generally well above the floor and few or none seem to have been deposited until the hollows had been partly filled with house wreckage and other material. The several articulated members noted in basin 2, near pit B, are an exception, since they lay directly on the floor; otherwise, human bones here were so scarce as to suggest a fortuitous advent.

The relationship of the basins to the central mound and to the "borrow pits" remains obscure (fig. 37). As previously noted, where our test trench cut the mound the latter consisted of earth mixed with ashes and refuse. The proportion of refuse to earth seems superficially rather low for a true midden, though probably no lower than was the case in mounds 4 and 6. It is possible that the soil taken originally from the basins was heaped in the center of a group of four or five basins of which we opened only two, and that the material used to cover, partly or wholly, the pit houses was taken from the "borrow pits," one of which lies in proximity to each basin. But why the earth from the basins was not used to cover the structures erected therein, is puzzling, unless some ritualistic or other sanctions required a mound in the center. There is some possibility that the mound, though partially of midden material, was actually the purposefully raised foundation for a temple structure or other primary installation, around which were semipermanent houses for the custodians or guardians who may have been a favored class. In this connection, it would be highly interesting to know whether basins similar to those we opened exist in the southwest and northwest quarters of the "council-circle" thus forming a balanced arrangement. I suspect that they do. In any case, whether or not the speculations advanced above prove valid, it is clear that the whole mound 17 complex is without parallel on the site and to me it strongly hints at a special purpose.

The idea of specialized function derives some added support from what is known of certain other sites in the area. At least four suggestively similar "council-circle" arrangements have come to my notice—two along the Little Arkansas in Rice County, the others in McPherson County 18 or 20 miles east, on southerly tributaries of the Smoky Hill River. In no instance, is there more than one such mounded and ditched ensemble in a village site. None of these has been systematically explored; and it is evident that until we know something more concerning the subsurface details of seemingly comparable arrangements, there can be no fruitful attempt to establish the basic features common to all and therefrom deduce their significance in the native way of life.

Our excavations in the mound 17 complex must be regarded as suggestive rather than definitive, and as must be apparent from the foregoing discussion, they leave in doubt a number of important points. I would suggest, therefore, that in any future excavations involving the "council-circles" of the central Kansas area, the work be planned with due allowance for the probable magnitude of the task ahead. It is to be expected, of course, that the complex may vary, and perhaps widely, from site to site. Our experience would indicate that it will almost certainly involve a great deal more than the routine opening or dissection of a simple refuse mound. In my opinion, no "council-circle" should be opened unless there is reasonable assurance that time, labor, and funds will permit its complete, as contrasted to our partial, excavation. This should include not only the central mounded area, but also the encircling ditch or borrow pits. Trenching and vertical slicing ought to be held to a minimum, perhaps limited to two narrow cuts bisecting the complex in two directions. If basins or other structural features or burial areas are indicated, further excavation should be by horizontal stripping of the entire complex, with meticulous and full plotting of all features on large-scale maps and clear determination of their interrelationships. The probability of earlier or later remains, intruding or intruded by, major features from time to time, and the likelihood of semisubterranean structures with sequent floor levels, should also be held clearly in mind. All this, of course, presupposes that any such work will be undertaken only by properly supported groups under the direction of a competent and experienced professional archeologist. Under any other conditions, much highly essential information must inevitably be lost, for piecemeal operations and good intentions without close unified direction cannot possibly do the job as it should and must be done.

There remain to be considered the cache pits we opened at the Tobias site. Not including those already described from mound 17, there were eight of these, all in the area between mounds 4, 13, and 17. Superficially, they were visible as small circular depressions wherein the prairie grass grew with unusual luxuriance. Excavation showed that their form generally followed a fairly consistent pattern with minor individual variations and that their fill varied within relatively narrow limits.

Generally speaking, the cache pits were large, circular in plan, with a cylindrical neck to a depth of 24 to 48 inches, below which the walls curved out and down to reach their maximum spread at the bottom. At the ground surface, diameters ranged from 40 to 78 inches; at the bottom, the range was from 45 to 99 inches; and depth varied from 30 to 82 inches. The smallest of the pits, 1A, contained very little refuse, and may not have been a completed regularly used cache. The others ranged in capacity from about 40 bushels in pit 2 to more than 200 bushels in pit 1. Excepting pit 4, whose uppermost strata were probably spread midden material from the overlapping mound 13, the upper 2 or 3 feet of fill in every pit were very hard and compact, with little cultural admixture. Below this were usually noted ash lenses, lumps and seams of charcoal, occasional sterile masses of red clay, and dark soil mixed with potsherds, animal bones, and a wide variety of complete and incomplete stone, bone, and other artifacts. Charred corn, cobs, occasional plum pits, and other vegetal remains were usually interspersed in the fill. Layers of charred grass, evidently the remains of floor covering, were present in three pits. All of the pits opened had been stripped of the food and materials for whose storage they were originally dug; what we took from them obviously represented refuse, objects which had been worn out or damaged and therefore discarded, or else, as in the case of the rare complete pipes, awls, and other small usables, were items that had escaped the owner's eye during house-cleaning or cache-emptying operations.

From our observations on the Tobias site, and on other cultivated or partly cultivated stations nearby, it is evident that large cache pits secondarily used for dumping of refuse, are present probably by the hundreds. This abundance accounts in large part, I think, for the comparatively small amount of refuse visible on the surface. The eight caches we opened at the Tobias site had a total combined capacity at least equal to the volume of any one of the refuse mounds, and their ash and artifact content was much higher. In other words, I suspect that by far the greater portion of the refuse emanating from the aboriginal occupancy of this and other similar sites lies underground in the re-used caches and not in the low mounds scattered over the sites.

No information is available, unfortunately, concerning the type of habitation used by the Indian occupants of the Tobias site. It seems probable that the dwellings were situated along the ridge among the mounds, but if so, there are no readily identifiable surface evidences thereof. It is possible that pit houses were in use, and that, as in mound 17, the depressions in which they stood have long since been filled in and obliterated. On the other hand, it may be that certain shallow pits and basins which appear to be too large for caches represent house structures, and that the floors were characteristically at or only slightly below the ground surface. Perhaps meticulous horizontal peeling of topsoil from some of the visible larger depressions, at a time of year when drought and high summer temperatures had not baked the ground to a forbidding hardness, would reveal postmold patterns identifiable as dwelling sites. Pending discovery of such traces we must leave undecided the question of house types at the Tobias and related nearby sites.

### FOOD REMAINS

As regards the foodstuffs on which the subsistence economy at the Tobias site was based, we have what is undoubtedly a very incomplete sample. Animal bones occurred in considerable numbers in all parts of the excavations, indicating the importance of the chase; but their nature, of course, would insure survival long after less durable vegetal materials had vanished. There is direct evidence of maize and beans, and from the abundance of bone hoes and large storage pits it is probable that cultivation was on a much more intensive scale than might be suspected from a superficial inspection of our finds of the seeds only. No doubt there were other domestic crops, such as squash and sunflowers, but of these we found no direct evidence. Of the many wild fruits, berries, nuts, seeds, and roots which the environment offered and which must certainly have been drawn upon, only the wild plum occurs in our collections. Considering the open nature of the site and the fact that it was only partially cleared, the data we obtained concerning dietary items are probably about as full as can be expected, but additional excavations might well extend the list somewhat.

*Maize.*—Charred kernels and cob segments were noted in every pit, mound, and basin we opened but, as would be expected in refuse deposits, nowhere were they present in quantity. From the pits, small short cobs are indicated: one complete and three nearly complete cobs from pit 1 are 33 to 40 mm. long by 12 to 17 mm. in diameter, with one 8-rowed and three 12-rowed examples. Pits 3 and 8 each yielded one fragment of 8-rowed cob. Whether these short nubbins were the standard product for the local growers is uncertain, but there is evidence that larger ears were present.

The best specimens of maize came from a pile of about a dozen husked ears (pl. 25, *d*), lying on the floor of basin 2, mound 17, approximately 3 feet north of pit C. Since most of these specimens have been preserved en bloc, complete measurements are not possible. One whole ear is about 120 mm. long; others may have exceeded this figure slightly. Cob diameters vary from 13 to 23 mm., total ear diameters from 32 to 36 mm. The kernels, varying from 5 to 9 per linear inch, are rather longer than wide, with trianguloid or ovoid outlines; they are 6 to 8 mm. wide by 7 to 9 mm. long. The ears bear 10, 12, and 14 rows of kernels, with the higher row numbers predominating. Generally speaking, the ears in this cluster are of moderate size but well formed, and have straight even rows of well-filled kernels of uniform size and shape. Comparison with the more fragmentary materials found elsewhere in the site suggests that these ears are of unusually fine grade, perhaps representing a selected series set aside for ritual purposes or as seed for the next year's planting.

They certainly represent a well-developed product, and presumably indicate that far from carrying on a perfunctory and incidental cultivation the local populace included practiced and competent horticulturists who knew what they were about.

*Beans.*—The only example noted was the charred half of a small split specimen from pit 1, of about the size of a navy or pinto bean.

*Wild plums.*—Four carbonized plum pits, 3 of them whole, came from the floor of basin 2, mound 17. This is one of the most abundant native fruits of the region, and was widely used in historic times by many tribes. Our small sample probably is no accurate index to the extent to which wild plums figured in the native economy.

*Bird remains.*—These were not common, and it would seem to be a safe assumption that birds were relatively unimportant in the economic and industrial life of these Indians. Mention has been made of the use of radii of the Great Blue Heron (*Ardea herodias*) for long tubes, doubtless for ornamental purposes; and shorter tubular beads were cut from the bones of various unidentified species. Among the unworked refuse bones the following species were represented, none by more than one specimen:

*Colimes virginianus* (bobwhite)
*Anas rubripes* (black duck)
*Lophodytes cucullatus* (hooded merganser)
*Podilymbus podiceps* (pied-billed grebe)
*Corvus brachyrhynchos* (crow)
*Bubo virginianus* (great horned owl)

To this list should be added the name of the raven (*Corvus corax*), a skull of which was taken out of a cache pit exposed in the roadside ditch just north of the mounds. The raven has been extinct in the area for fully half a century and very rare for a much longer period, but clearly it was known, and probably very well, to the Indian inhabitants of the site.

*Fish remains.*—The only fish bone identified from the site is the right clavicle of a catfish (*Ameiurus* sp.); it was found in pit 1B.

*Turtle remains.*—These occurred in some numbers in several of the pits. Bones and carapace fragments of the terrapin (*Terrapene*) were much the commonest; none showed any evidence of modification for artifacts. A few bones of the snapping turtle (*Chelydra*) came from pit C, basin 2, mound 17.

*Mammalian remains.*—Animal bones were found in all parts of the site tested, but were most plentiful in the refuse fill in the cache pits. Those of the larger mammals were often broken or split to an extent that precluded their positive identification. Our sample indicates pretty clearly, however, that hunting provided an important part of the subsistence economy here, and that it was the larger forms on which the hunters mainly drew.

The following species, listed in order of abundance of identified bones, are represented:

| | |
|---|---|
| Bison (*Bison bison*) | 59 |
| Dog (*Canis familiaris*) | 29 |
| White-tailed deer (*Odocoileus virginianus*) | 18 |
| Antelope (*Antilocapra americana*) | 11 |
| Prairie dog (*Cynomys ludovicianus*) | 4 |
| Kangaroo rat (*Dipodomys ordii richardsoni*) | 3 |
| Badger (*Taxidea taxus*) | 2 |
| Ground squirrel (*Citellus tridecemlineatus*) | 2 |
| Dog or wolf | 1 |

The large proportion of dog bones present is rather surprising, though it is clear from the historical record that dogs were plentiful among the early historic Indians of this time period and locality. According to Ray Gilmore, who made these identifications, "a number of bones are of late foetal or new-born individuals." There are also a number of mandible fragments, usually half or less of this member being present. One is of an immature animal about the size of a terrier. The others, six in number, are considerably larger, closely matching the corresponding bones of a 76-pound police dog in the United States National Museum collections. Young and Goldman, who examined these specimens in October 1945, are of the opinion that an animal intermediate in size between the coyote and Plains wolf is indicated.

### POTTERY

In marked contrast to their scarcity on the site surface, potsherds were present in considerable numbers in every pit, mound, or other aboriginal feature investigated by us. Most or all of the fragments are from utilitarian rather than ornamental or "ceremonial" vessels, and the native potters seem to have been interested primarily in the manufacture of containers and cooking pots, not in the creation of works of art. The pottery complex, however, is rather heterogeneous in character, and several markedly dissimilar wares are indicated. The description which follows is based on analysis of 4,896 sherds, including 424 rim fragments, and 9 restored vessels. The distribution in our excavations of the several wares and varieties recognized is summarized in table 3.

#### GENESEO PLAIN

By far the larger portion of the material, including seven of the restored vessels and 86 percent of the sherds, consists of sand-tempered gray wares,[20] which may be divided into two types. Most abundant

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[20] Because of the simple, usually undecorated, character of the rim fragments, it is exceedingly difficult to estimate the number of vessels represented by our sherd series. Wherever it has been possible to identify two or more pieces as parts of the same vessel I have considered them as one sherd regardless of whether or not they actually fitted together. I would guess, probably conservatively, that the nearly 400 gray-ware rim sherds represent upwards of half, possibly even three-fourths, that number of vessels. Moreover, since gray wares predominated in every one of the excavation units, it may be inferred that they fairly represent the typical culinary pottery of the site.

TABLE 3.—*Summary of pottery from the Tobias site (14RC8)*[1]

| Pottery type or ware | Cache pit | | | | | | | | | | | | Mound 4 | Mound 6 | Mound 17 | | | Potsherds | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1A | 1B | 2 | 3 | 3A | 4 | 5 | 6 | 8 | 8A | 9 | | | Basin 1 | Basin 2 | Trench | Number | Percent |
| Geneseo Plain | ----- | 261 | (a) | 10 | 354; (b) | 92 | 111 | 292 | 243 | 199 | 83; (c) | 83 | 131 | 640 | 643 | 286; (d) | 182 | 3,610 | 73.6 |
| Geneseo Simple Stamped | ----- | 115 | (e) | 2 | 34 | 27 | 32 | 55 | 35 | 48 | 6 | 31 | 5 | 63 | 85; (f) | 56; (g) | 21 | 615 | 12.5 |
| Geneseo Red Filmed | (h) | 39 | (i) | ----- | 68 | 11 | 17 | 3 | 5 | 34 | 7 | 15 | 23 | 30 | 62 | 61 | 17 | 392 | 8.0 |
| Miscellaneous: | | | | | | | | | | | | | | | | | | | |
| Cord-roughened | ----- | 9 | ----- | 3 | 10 | 3 | 8 | 1 | 16 | 7 | ----- | ----- | 2 | 23 | 47 | 7 | 6 | 142 | 2.9 |
| Fabric (?) impressed | ----- | ----- | ----- | ----- | ----- | ----- | 2 | 1 | ----- | ----- | ----- | ----- | ----- | ----- | 1 | ----- | 3 | 7 | ----- |
| Incised | ----- | 6 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 2 | ----- | 1 | 1 | ----- | 2 | 1 | 1 | 14 | ----- |
| Check stamped | ----- | 1 | ----- | ----- | 1 | ----- | (j) | ----- | 1 | ----- | ----- | ----- | ----- | ----- | ----- | 1 | ----- | 4 | ----- |
| Painted (?) | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1+ | 1+ | ----- | 12 | ----- |
| Other | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 | ----- |
| Shell-tempered plain | ----- | 5 | ----- | 1 | 37 | ----- | 2 | 2 | ----- | 5 | 1 | ----- | 5 | 5 | 5 | 36 | 4 | 108 | 2.2 |
| Chupadero B/W | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 | 1 | ----- |
| Total | ----- | 436 | ----- | 16 | 504 | 133 | 172 | 354 | 300 | 296 | 97 | 130 | 167 | 761 | 846 | 449 | 235 | 4,896 | ----- |

[1] Letters in parentheses indicate whole or restored vessels, in addition to miscellaneous shords, as follows: (a) USNM 388622; (b) USNM 388611; (c) USNM 388754; (d) USNM 388898; (e) USNM 388623; (f) USNM 388888; (g) USNM 388983; (h) USNM 388590; (i) USNM 388624; (j) USNM 388687.

is a ware for which I propose the name Geneseo Plain; it is represented by four restored vessels (pl. 26) and approximately three-fourths of the sherds. In these the paste is generally fine to medium in texture, but is sometimes poorly compacted. Inclusions are rounded quartz sand particles, often iron stained; they range in size from fine (under 0.25 mm. diam.) to medium (0.25–0.50 mm. diam.), rarely larger, were generously used, and are not usually visible on sherd or vessel surfaces. Fractures are granular; where fine iron-stained sand tempering occurs, the fractured surface has a very characteristic finely spongelike appearance to the naked eye. In color, sherds are usually dark slaty gray at the core, whereas the surfaces are dark to light gray or brown, with much spottiness or clouding by firing irregularities. Interior surfaces are rough, uneven, carelessly done; exteriors are better smoothed, but unpolished, and are often soot-encrusted. Surface hardness varies from 3.0 (calcite) to 4.5 (chabazite).

Vessel forms, so far as now known, consist of amphoralike jars (fig. 39, and pls. 26, 27), with a body more or less ovate in vertical profile, a rounded or rarely flattened circular base, rounded shoulder, and constricted neck; they range in height from 21 to 36 cm., in maximum diameter from 19 to 31 cm., and the walls vary from 4 to 8 mm. in thickness. Rims are simple, unthickened, either straight and vertical or slightly recurved and flaring, from 2.5 to 8 cm. high; lips are rounded, less commonly flattened, or sometimes slightly everted. Appendages on vessels are not common, but when present consist of one, rarely more, of the following items: medium to large loop handles, 2 per vessel, attached usually by riveting, extending vertically from rim to upperbody, and sometimes embellished with a small nipplelike or laterally flattened protuberance at the upper, lower, or both angles of attachment; or small vertically set lugs, perforate or imperforate, whose position on the vessel is not known; or small imperforate tabs, laterally flattened, 4 per vessel, rarely affixed to rim exterior at or just below lip; or a narrow rounded or ridged neck fillet, plain or diagonally incised, which encircled the vessel about 1 to 3 mm. below lip; or a similarly placed single or double row of closely spaced laterally flattened or nipplelike protuberances or fingernail gougings. Decoration is confined to the neck fillets or zoned protuberances just noted, to occasional crude linear incising or punctating on handles, and to incisions, usually diagonal, across lip surfaces; it apparently is usually absent from vessel body and shoulders.

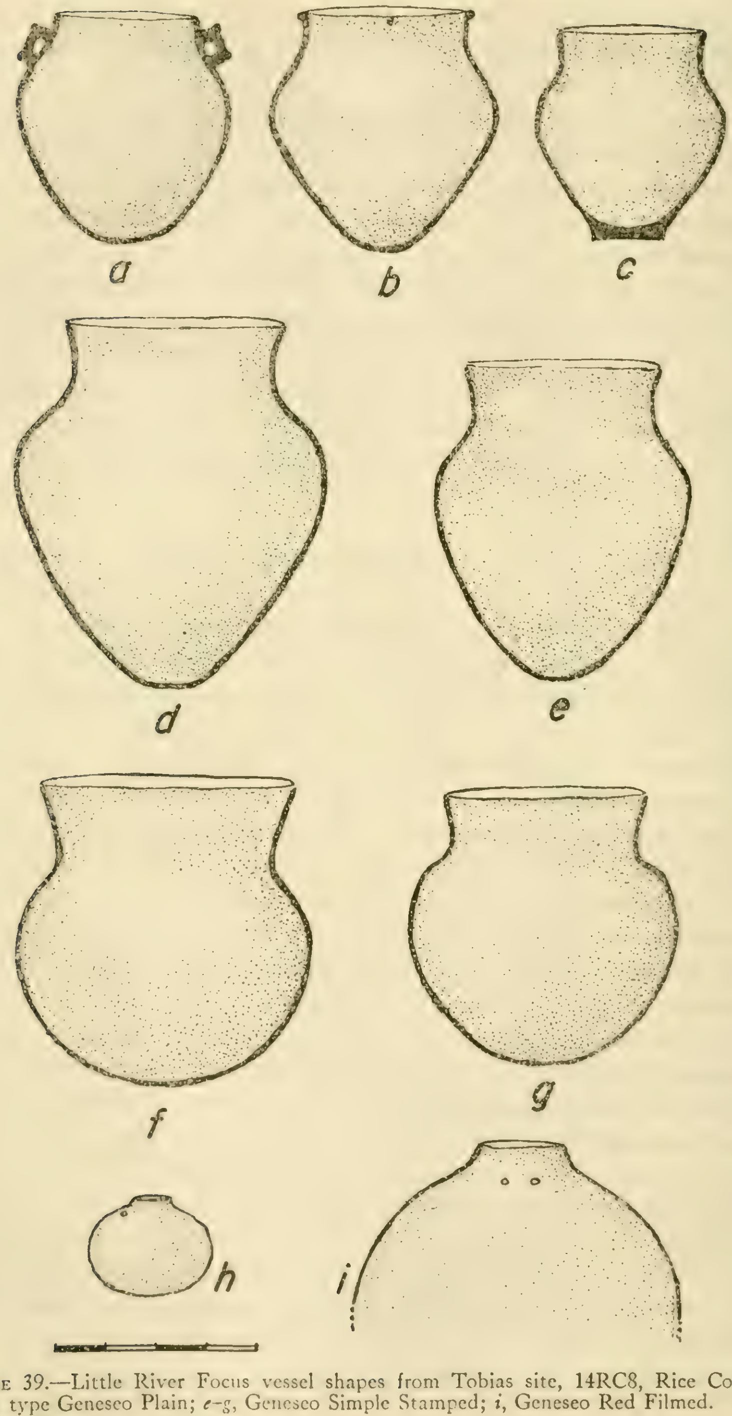

FIGURE 39.—Little River Focus vessel shapes from Tobias site, 14RC8, Rice County. *a–d*, type Geneseo Plain; *e–g*, Geneseo Simple Stamped; *i*, Geneseo Red Filmed. Scale shown, 20 cm.

### GENESEO SIMPLE STAMPED

Less common, but obviously closely related to the foregoing, is a second gray ware designated Geneseo Simple Stamped. It is represented by three restored vessels (pls. 28, 29, *a*) and about one-eighth of the sherds. It appears to be virtually identical with Geneseo Plain, except that the vessel exteriors have been worked over with a grooved or thong-wrapped paddle. The resulting parallel ridges are never very marked, nor are the individual corrugations continuous for more than a few centimeters; sometimes they occur in small blocks, those in one block being at a slightly different angle from those in adjoining blocks, though usually with a tendency toward vertical or slightly oblique, never horizontal, orientation of ridges. Either intentionally, or incidentally through wear, the impressions are often much subdued and almost obliterated. On two vessels the corrugations extend up the rim to the lip; on the third, they end at the neck, and the otherwise plain rim exterior is ornamented with a double row of deep fingernail gougings and low nodes. Vessel forms do not differ significantly from those of Geneseo Plain, unless perhaps in being a trifle broader and squattier; none of our specimens has a handle, and only one has any suggestion of flattening at the base. These differences, however, are slight, and it seems very probable that a larger comparative series would weaken rather than strengthen the apparent distinctions. It seems probable, too, that an indeterminate number of the sherds classed as plain ware, as well as some of the undecorated rims, handles, and other pieces in our collection, were originally in vessels part of whose surface may have been stamped. In short, the wares described and named above for classificatory convenience may not have been distinguished as separate wares by the potters who made the vessels.

Additional details regarding gray ware rims, appendages, decorative devices, and other features must be noted. Not more than half a dozen rimsherds and none of the handles or lugs bear stamped impressions, and thus all could be classed technically as plainware. Actually, as we have seen, plain rims do occur on stamped pots, and some of the handles scarcely afforded a suitable area for successful application of a stamped pattern. Since there seems to be no valid basis for the allocation of a particular rimsherd or handle to one or the other of the wares described above, I have included all such specimens in the broader category of grayware. The low incidence of the items discussed in the following paragraphs, relative to the estimated number of grayware vessels represented, should make abundantly clear the drab simplicity and probable uniformity of the vast majority of pots at the site.

Vessel handles include several types (fig. 40 and pl. 30). There are 15 complete and fragmentary loop handles, all with a circular or thick subcircular cross section. Six of these are midsections; the others are riveted into a sherd, or else have a thinned or tapering end obviously intended for insertion into a hole in the vessel wall. This union was further strengthened by the application of a clay collar pressed firmly about the handle base at each end. Occasionally there is a pronounced boss on the vessel interior where the end of the handle has been flattened out, but other specimens lack this feature and show no superficial evidence whatever of the inserted member. The smallest example is 7 mm. in diameter, and has a 5 by 7 mm. opening for the carrying cord; the largest is about 20 mm. in diameter and has an opening nearly 25 mm. across. Usually these loops are undecorated, but one bears 4 crudely incised diagonal lines, and a second has 16 circular grass-stem punctates unevenly arranged in 3 irregular vertical rows (fig. 40, *c*).

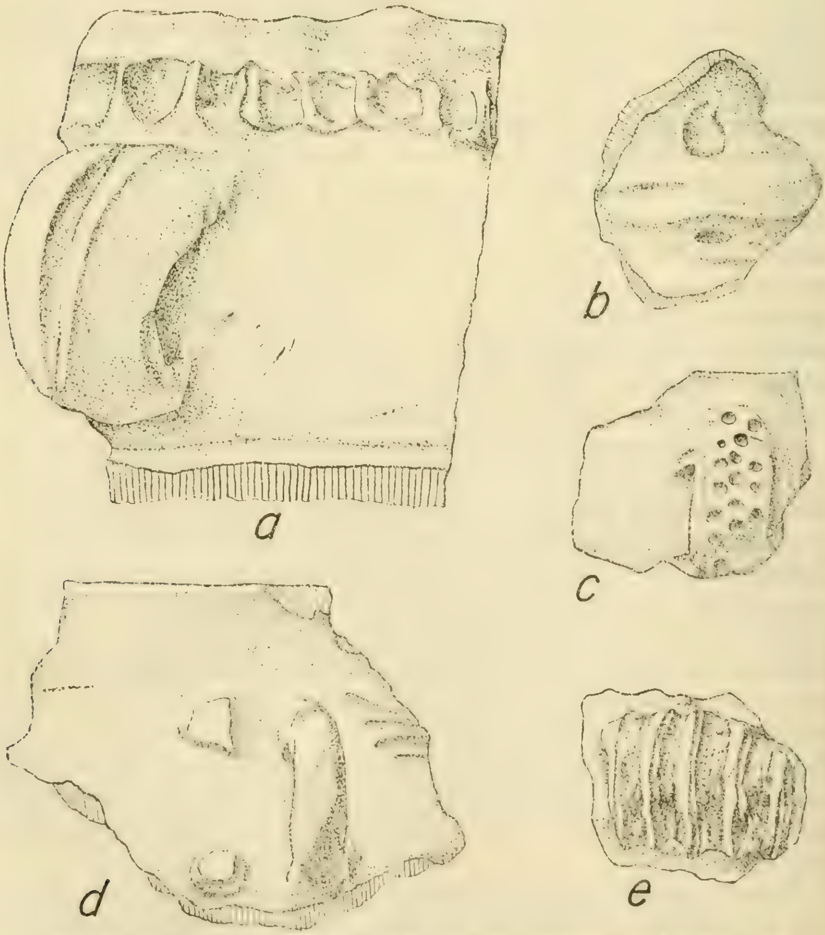

FIGURE 40.—Handle sherds from Tobias site, Rice County. Height of *a*, 10 cm.

Strap handles include all specimens in which thickness is one-half or less of the width; 12 examples are so classified but most are mid-sections and give no clue to the method of attachment. Some were certainly riveted, others apparently were merely stuck on. They vary in width from 15 to 33 mm., in thickness from 7 to 15 mm. As with the loop handles, the straps seem always to have been attached with their upper end 15 mm. or more below the lip. Unlike the loops, they were commonly decorated, if we may so dignify the simple clumsy vertical or diagonal scorings present on 5 specimens (fig. 40 and pl. 30, *a*, *f*).

Small perforated lugs, whose position on the vessel is unknown, were three in number. One has four deep diagonal incisions across its midline, with a nipplelike protuberance at each end; another is longitudinally ribbed; the third is undecorated.

In the matter of neck or rim decoration (fig. 41), six sherds have a plain narrow applique fillet 7 to 12 mm. below the lip; on a seventh, the fillet has closely spaced diagonal incisions which produce a rope-like effect. Twenty-two sherds have a row of nodes in a similar position, made by pinching up the clay between thumb and forefinger or by applying bits of clay so treated. Ten other specimens have two rows of such nodes, the upper row about 1 cm. below the lip and the other about 1 cm. below the first. In a few cases, these nodes are little more than deep fingernail gougings. Rim nodes are much less common; three, of an original four, occur on one of the vessels (USNM 388898), where they were stuck on so that their tops are flush with the lip.

Of approximately 390 grayware rimsherds, 301 have a rounded lip, of which in turn 176 are undecorated, 78 diagonally incised, 33 "pie-crust" scalloped, 8 longitudinally incised, and 6 punctated. Of 69 flattened lips 44 are plain, 7 diagonally incised, 13 scalloped, and 5 punctate. The remaining 20-odd sherds include a few examples of vertical incising on the lip exterior.

Flat circular vessel bases prove, on analysis of our collections, to be less common than I had supposed from inspection of local collections. Aside from one vessel (USNM 388622) so provided, there is but one other example: an incomplete base sherd from pit 3. This pit, it should be noted, yielded 37 shell-tempered sherds, the highest number found in any single excavation unit. There is a reasonably good chance that flat bases here may be due to influences from another slightly deviant shell-tempered tradition of more southerly distribution.

### GENESEO RED FILMED

Much less abundant than the foregoing graywares, but like them occurring in all parts of our excavations, is a strikingly different

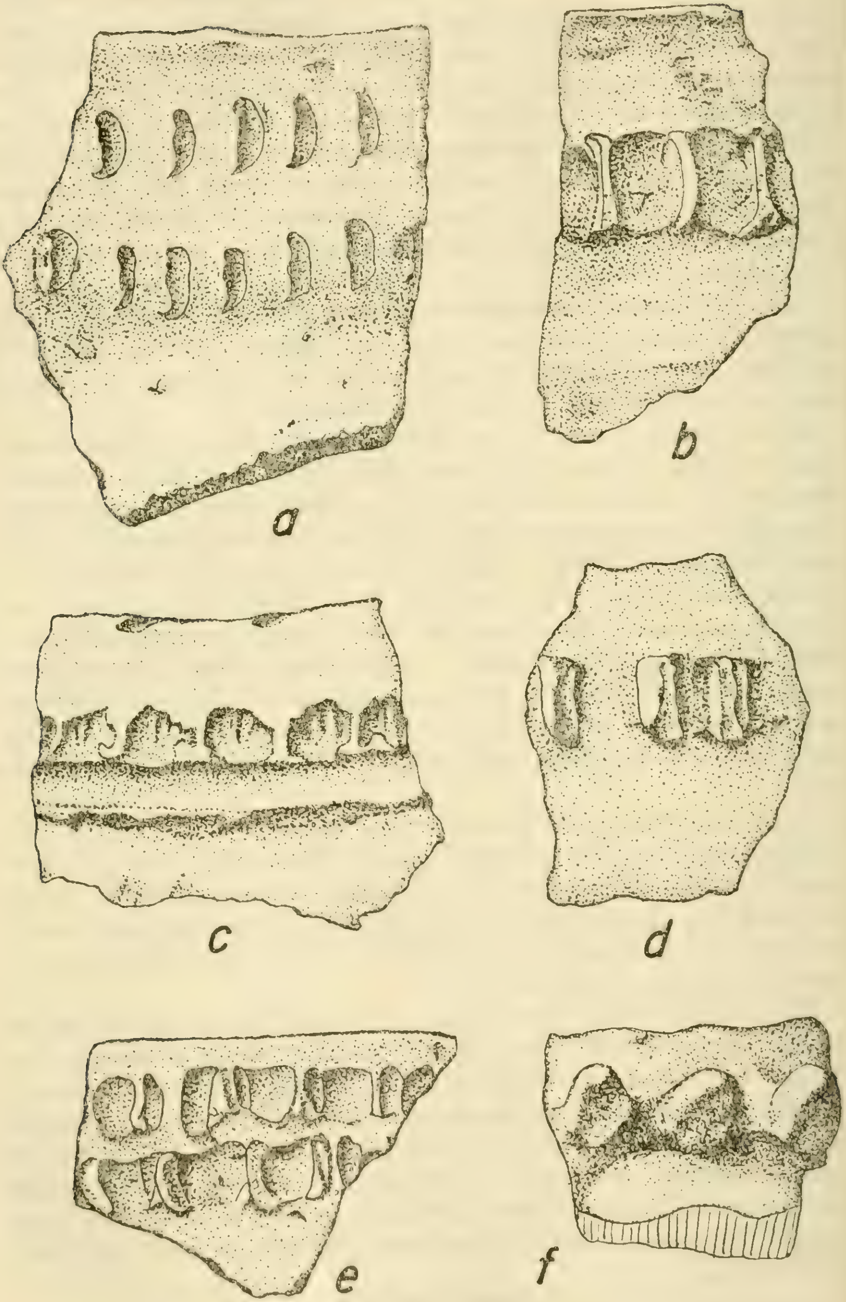

Figure 41.—Pinched, gouged, and noded rimsherds from Tobias site. (Actual size.)

type which may be called Geneseo Red Filmed. Of this there are 392 sherds, one large partially restored jar, and a miniature vessel of somewhat uncertain affinities. The ware is characterized by a fine-textured, even paste, generally well compacted; inclusions are fine to medium-rounded sand particles, usually abundantly present, though in a few pieces there is no visible aplastic. Sherd cores are either slate gray or, more characteristically, a light yellow buff, and surfaces are buff to light brownish; hardness varies from 3.5 to 5.0. Sherd surfaces are unevenly smoothed interiorly, whereas exteriors are carefully and evenly smoothed, and sometimes exhibit a faint glossiness. A dull to bright red film, often fugitive in character and therefore surviving only in irregular patches, occurs on the exterior and sometimes also on the interior. Vessel forms, to judge from rimsherds and the partially restored upper portion of a large jar, are quite different from gray ware forms. The partially restored specimen (USNM 388590; pl. 27, *b*) is from pit 1; it suggests a full-bodied globular (or pear-shaped?) form at least 31 cm. in diameter, with insloping rim, and a strongly constricted mouth 8.5 cm. in diameter. The shape of the base is unknown. There are 2 perforations, 4 cm. apart and 6 cm. below the lip; they are 8 to 10 mm. in diameter and may be for a thong. There are 16 rimsherds, all simple and unthickened; those large enough to permit a guess as to attitude suggest incurving or straight insloping rims like that on the above jar fragment. Lips are rounded, rarely flattened, and undecorated except for one which is carelessly "pie-crust" scalloped. Appendages are not plentiful; they include rare riveted loop handles and, more characteristically, thick squarish wedge-shaped lugs with a cylindrical perforation (fig. 40, *b*). The loop handles may have been vertically attached; the lugs in some cases seem to have been horizontally attached to the vessel body. The latter were as much as 15 to 20 mm. thick, 40 mm. wide, and projected outward 20 to 25 mm.; all seem to have been plain and undecorated, except for the red paint or film. All of the massive lugs found by us were of red-filmed, none of gray, ware. Decoration was apparently rare on the red-filmed ware: 22 sherds have subdued cord impressions, but as small isolated blocks rather than overall roughening; and faint traces of simple stamping occur on 41 other sherds.

Of interest is the miniature vessel (USNM 388624) provisionally assigned to the red-filmed ware. It was recovered from pit 1B, one of three partially overlapping caches whose sequence of construction was not determined. The vessel has a mottled grayish color, but here and there are faint traces of a pink wash. The body is globular, slightly wider than high, and a low rim slopes inward to a small mouth. On each side of the orifice, about 1 cm. below the lip, is a single 3-mm. perforation. Measurements are: maximum diameter, 6.1 cm.; height, 5.2 cm.; orifice, 1.5 cm. There is a curious similarity in shape and proportions between this little piece and the larger jar fragment (USNM 388590) reported above, which came from another pit in the same group. The form is not typical of any previously known Central Plains ware (fig. 42, *b*, and pl. 27, *c*).

In addition to the three wares described and named above, there are suggestions of one or two others which, for want of an adequately representative sherd series, I have not attempted to name. Thin hard cord-roughened sherds, to the number of 142, recall the prehistoric Upper Republican pottery of northern Kansas and southern Nebraska, but their presence, if sparing, in virtually every excavation unit at the Tobias site seems to support the view that the ware was used, and probably manufactured locally. As a group, the sherds are characterized by a fine compact dark-gray paste, with somewhat coarser and less abundant gravel inclusions than are found in the non-cord-impressed wares; the sherds are from 3.5 to 7 mm. thick, and hardness is 4.5 to 5.5. Medium to fine cord impressions, often much worn or rubbed down, cover exterior surfaces. Aside from the cord-roughening, however, the sherds are not all so easily distinguished from the Geneseo gray wares; some in fact are identical in paste, tempering, etc. Vessel forms are unknown, and cannot even be guessed at from our sherd sample. There are 11 rimsherds, all but one of them simple unthickened, either straight and vertical or slightly curved and outflaring, and none apparently more than 2.5 or 3 cm. high. Five have cord impressions extending up the rim exterior to the lip. Lips are rounded (9) or flattened (2), with

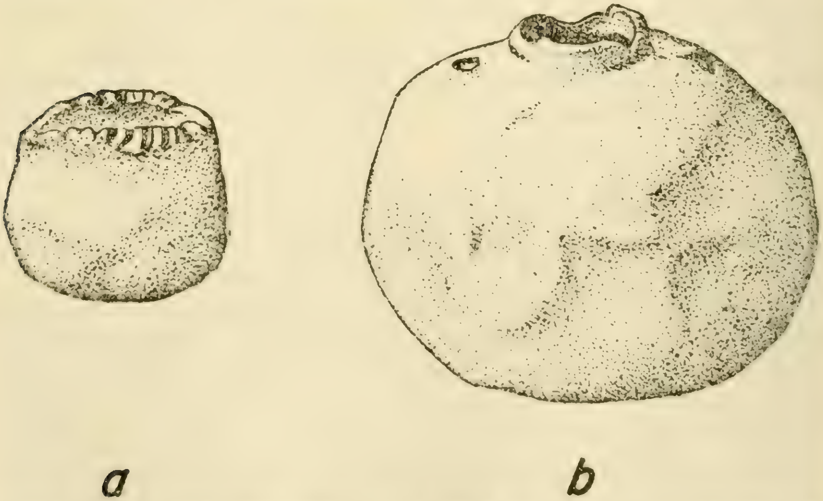

FIGURE 42.—Miniature pottery vessels from Tobias site. *a*, Pit 1 (USNM 388591); *b*, pit 1 B (USNM 388624). (Actual size.)

diagonal cross incisions (5), cord impressions (5), or else are plain (1). A single rim, slightly thickened and weakly flared, has 5 deeply incised horizontal lines on its exterior surface, with a rounded diagonally incised lip, and conforms in every particular to typical Upper Republican pieces.

Shell-tempered sherds, totaling 108, likewise turned up in almost every one of our excavation units, but with the exception of pit 3 and mound 17, basin 2, not more than 5 were found in any single pit, basin or mound. The exceptions seem to be due to deposition together of fragments from a few large jars. The sherds generally resemble Geneseo Plain ware in color and superficial appearance, but have a somewhat softer chalky "feel." Vessel forms are not known, although the size and curvature of some sherds suggest large jars perhaps like those of the Geneseo series. Two rounded lip sherds from mound 17, basin 2, are diagonally incised; one has two nodes affixed to the exterior flush with the lip. From the same excavation came part of a flat circular vessel base. From pit 3 came 7 lip sherds, from 1 or at most 2 vessels; all are flat, and bear a row of closely spaced circular punctates. The general impression conveyed by these sherds is one of marked similarity to Geneseo Plain ware, but I am not yet prepared to say whether the jars were locally manufactured or are the result of southern trade relations or technological stimulus.

Of most of the remaining sherds whose provenience has been indicated in table 3, little can be said. The check-stamped jar (USNM 388687; pl. 29, *b*), besides which there are four similarly treated sherds, differs only in its unusually high rim and its surface markings from the Geneseo Simple Stamped ware, and is undoubtedly a local product. I know of no other check-stamped vessels or sherds from the Kansas-Nebraska region. The painted fragments include one plain gray-ware rim, with traces of a fugitive red scalloped or serrated border pendent from the inner edge of the lip; and several sherds (now missing) of a dull orange vessel whose interior surface shows part of a brown line or band and numerous small circular spots of the same color. These may be the fluid line and splashings from liquids once placed in the container, but this seems rather unlikely. The incised sherds are mostly small and offer scant evidence as to the nature of the vessels from which they came or the decorative pattern of which they once formed a part. Various simple groupings and combinations of straight or zigzag lines are suggested; their nature is indicated in figure 43. The 7 "fabric (?) impressed" specimens include 1 small possibly net-impressed sherd, 3 impressed with what may have been coiled basketry, and 3 that appear to have a brushed finish.

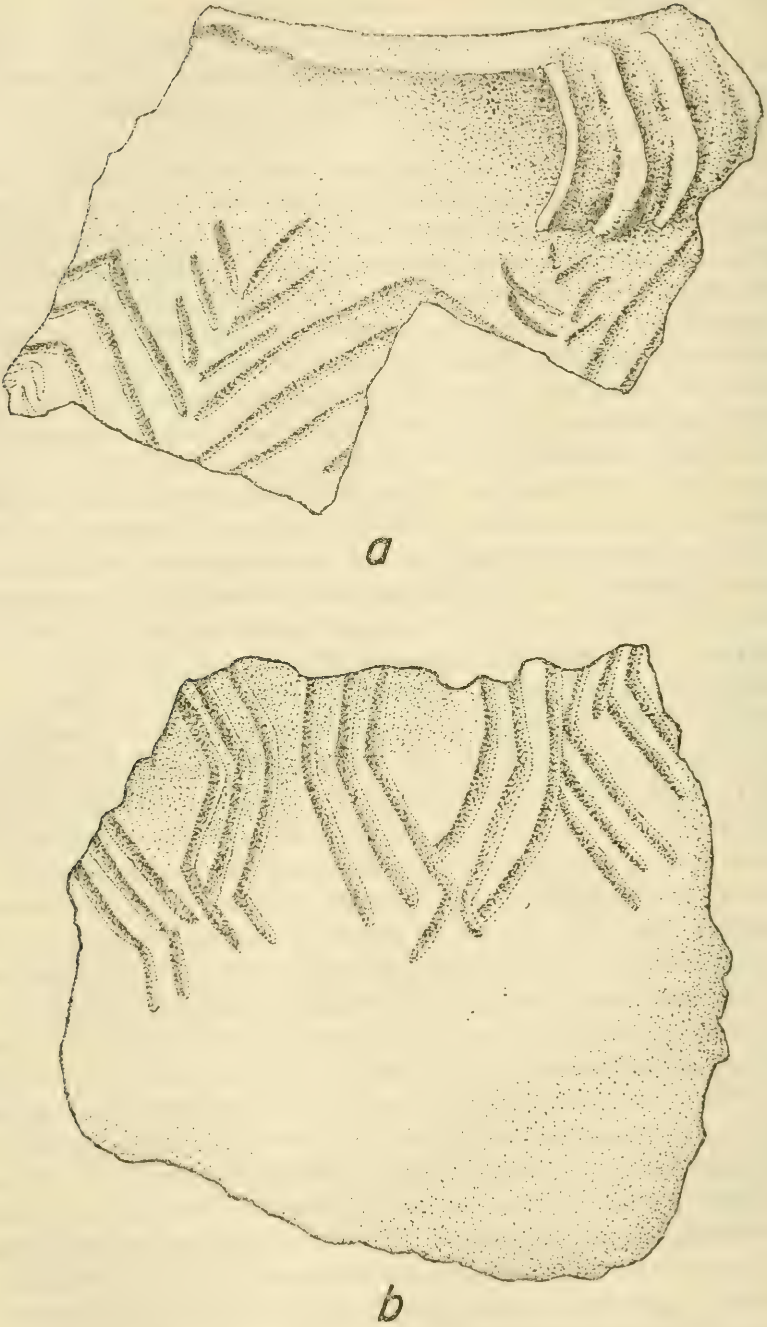

FIGURE 43.—Trailed sherds from Tobias site. *a*, Pit 5 (USNM 388700). (Actual size.)

### EXOTIC WARES

So far as we can judge at the moment, the various pottery types described above can be considered local products, which may have been influenced in a few instances by the ceramic traditions of other nearby groups. There are, in addition, two or three sherds certainly or possibly not of local manufacture. Such foreign pieces, where they may be identified are of special interest for the hints they give as to trade relations with other regions and the clues they may provide as to chronological correlations. Unhappily, our exotic sherds from the Tobias site throw little light on either of these problems.

Near the west end of our initial trench through mound 17, at a depth of 11 inches among some large sandstone boulders, in square 60 W 3, was found a small gray sherd (USNM 389024) bearing painted linear decorations. Mera states (letter of August 12, 1940) that this sherd—

> agrees specifically in paste and paint with late forms of Chupadero Black-on-white, a pottery type confined to the southern half of New Mexico. Although the paint is normally matte in finish, glazing is not uncommon. Note the transparent glossy stripes on either side and below the brown patch of pigment, where the paint was applied too thinly and has become largely invisible. This ceramic type is of little use in dating as it is known to have persisted to some extent from sometime in the 13th century up until about the middle of the 17th, a surprisingly long time for a southwestern black-on-white type to survive. [Pl. 49, *f*.]

Two other gray sherds (USNM 388901), both from mound 17, basin 2, remain unidentified. The first has a thickly sand-tempered light-gray paste, which looks like local ware, but the well-smoothed surface bears a faded black paint decoration consisting of wide uneven parallel lines, crossed by uneven parallel zigzags. The second sherd, similarly polished and sand-tempered, has irregular dark spots, but no definite evidence of a painted design.

### OTHER POTTERY OBJECTS

Our findings indicate that aside from the utilitarian vessels and occasional miniature pieces characterized in a preceding section, there was relatively little work in clay. Eight pottery disks were found. Seven of these, ranging in maximum diameter from 20 to 37 mm., were fashioned by grinding down the edges of potsherds until a circular or subcircular outline was attained. The edges are usually irregular; surfaces are plain, except in two examples which show simple stamping. The eighth specimen was made by pressing out a small clay pellet; it is thickest at the center, and expansion cracks radiate out toward the edge. The disks are 5 to 8 mm. thick; none is perforated (pl. 30, *g*, *h*).

From the bottom of a pit in square 60, mound 17, came a flattened oblong lump of moulded clay, irregularly fashioned, with rounded ends. It measures 13.5 by 7.7 by 4.5 cm. (fig. 44); its purpose is unknown.

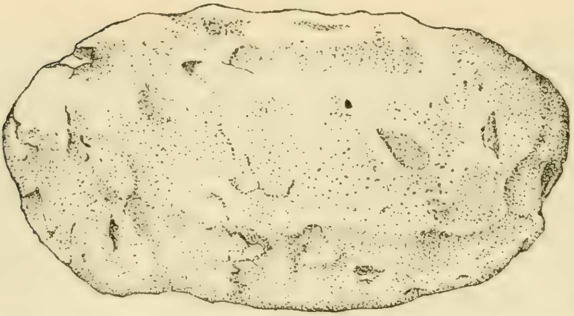

FIGURE 44.—Molded lump of clay from mound 17 excavations, Tobias site. Length 135 mm.

### OBJECTS OF ANTLER

*Hollowed tines.*—There are three of these curious objects, all somewhat damaged and restored (pl. 31, *e–g*.). They range in length from 15 to 23.5 cm., in maximum diameter from 1.9 to 3.2 cm., and the surfaces have been carefully, but not always completely, smoothed or even polished. The tip of the smallest has been broken off; in the others, the tips have been blunted and smoothed down. All retain the natural even curvature of the antler, and have been slightly tapered proximally to a rounded or squared extremity. In addition, each has been hollowed out for a distance of 6 to 9 cm. from the proximal end, so as to create a scooplike effect. This hollowing was accomplished in the two larger specimens (USNM 388682), from pit 3A, and (USNM 388836 from mound 17,· basin 1) by hacking or grinding away the compact surface tissue on the inner curved face of the tine, until the cancellous structure was exposed in a shallow longitudinal hollow. The third specimen (USNM 388926, from mound 17, basin 2) is badly broken, but seems to have had a much deeper cavity which was on the side of the curve; the remaining edge of the cavity is well smoothed and even, and most of the cancellous tissue appears to have been carefully scraped away. This piece has four short transverse lines incised across the outer face about midway of its length. The dressed outer face of each of the two smaller specimens terminates proximally in a low transverse flange 2 to 7 mm. wide. There is nothing about the specimens, or in their associations or manner of occurrence, to indicate their purpose, and I have been unable to find any record of similar artifacts from the Plains or elsewhere (fig. 45).

*Projectile point.*—From mound 17, basin 2, came a well-made straight conical antler tip point, the only one of its kind found on the site (pl. 34, *i*). It is 52 mm. long, with a circular base 11 mm. in diameter, and has a conical socket 12 mm. deep. There is no basal tang. Similar points have a wide geographic and temporal distribution throughout the Eastern United States. In the trans-Missouri plains,

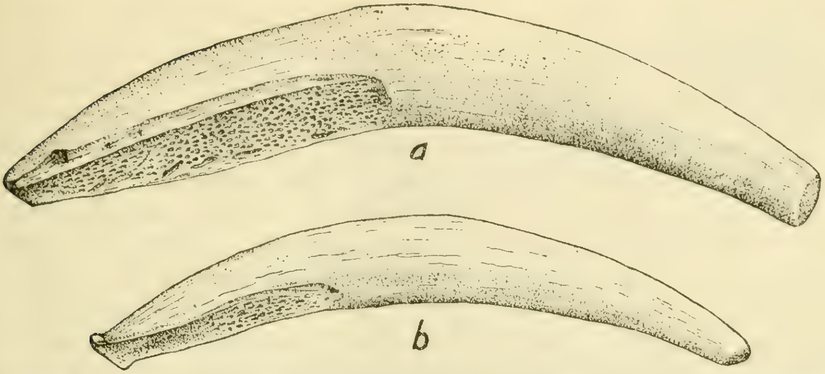

FIGURE 45.—Hollowed antler artifacts from Tobias site. Length of *a*, 23.5 cm. on outside curve.

they have been found in the Leary and Fanning sites, both Oneota; and closely similar specimens with square bases are known from the Wright site (protohistoric Pawnee) near Genoa, Nebr. On an earlier time level, specimens from the prehistoric Renner site (Hopewellian) differ in having a basal tang.

*Scored object.*—The short rodlike specimen shown in plate 35, *l* (USMN 388683) has been extensively worked down, so that it consists mostly of cancellous tissue with a thin layer of harder structure on each side. It has a somewhat elliptical cross section. The ends are damaged, but one appears to have been bluntly rounded, the other conically socketed to a depth of 8 mm. or more. About 10 cm. from the blunt end was a biconically drilled perforation 4 mm. in diameter. The flattish surface below this hole is split on one side the full length of the object, and had 28 short transverse cuts averaging 5 per cm. The piece is well shaped and carefully smoothed on all surfaces; it is 68 mm. long, 10 mm. wide, and 8 mm. thick.

*Worked tips.*—A blunt rounded antler tip fragment 4 cm. long has four groups of short closely set transverse cuts on opposing sides. These groups include 8, 8, 6, and 5 cuts, the lower numbers possibly being due to extensive rubbing down of the tip. There is no way of judging whether this piece was broken from an implement or represents an otherwise unworked tine (pl. 35, *k*).

Another antler section from near the end of the tine has been split lengthwise and the cancellous tissue largely removed. The split edges have been smoothed; the distal end is blunted, and to a distance of about 3 cm. from the tip has numerous transverse scratches or knife scars on the exterior surface. Present length of the piece, which is badly weathered and evidently incomplete, is about 8 cm.

*Socketed basal section.*—The weathered and cracked basal portion of a deer antler, detached just below the "burr," was evidently partially smoothed by rubbing. About 9 cm. above the proximal end, a lateral tine has been detached, leaving a rounded stump. The distal extremity is cut off square, and has a shallow irregular cavity about 8 mm. deep. Neither end has been smoothed. The length is 13 cm.

*Cut tines*—There are several of these; some may be unfinished implements, others are probably refuse from artifact manufacture. From pit 3A came a forked tine 11 cm. long, of which the larger branch bears numerous fine lengthwise striae and has had the tip partially sawed all-round and then snapped off; a lateral tine, also finely striated, has had the tip broken off. The diameter of the main stem at the cut is slightly greater than the basal diameter of the finished projectile point already noted; and the striae, which considerably modified the original antler form to a distance of ca. 12 mm. below the cut, suggest that the tip may have been roughed out by scraping prior to detachment and final polishing. Another tine from which the tip has been neatly severed is similarly striated for a short distance below the cut; it, too, may be rejectage from manufacture of a projectile point. A third specimen, 6.5 cm. long, has the tip broken off and a deep cut partly encircling the middle.

*Eyed and/or notched objects.*—This includes 1 complete and 13 fragmentary specimens; all are made of narrow, flat or subcylindrical strips of antler or possibly bone, so thoroughly worked down that positive identification is not possible. With one exception, all are curved, and there is commonly a faint suggestion of fine cancellous tissue on the concave surface. The edges are well smoothed, and on none is it possible to detect any scars or other clues to the manner of detachment of the strips.

The complete specimen (USNM 388704) is from pit 5, from which came five of the fragments. It is evenly curved and well polished, and has a length of 24.5 cm. along the arc or 19.4 cm. along the chord. Near the middle it measures 4.5 by 5 mm. in cross section, whence it tapers toward each end. One end has been neatly squared and perforated; at the other end, which seems to have been broken or cut through a similar hole, is a deep transverse groove across the outer convex surface of the curve. The concave surface shows faint traces of cancellous structure; the curve almost exactly duplicates that in several unworked antler tines and in the largest hollowed tine described above (pl. 34, *c*).

The fragments add little to the foregoing information beyond indicating the range of variation in width (4–8 mm.), thickness (2–5 mm.), and cross section (thick elliptical to thin planoconvex). Eight have a small biconical perforation near one end, and in two instances there is evidence that the specimen had been previously broken off through another similar hole. In a single instance, this hole is slightly worn lengthwise as from a cord or string. Three specimens have a transverse groove across one dressed end; the edges of another have one and two notches near the end. All of the fragments, whether terminally grooved, notched, or pierced, show at least one more or less ragged fractured end, usually that opposite the groove or perforation. In addition to the five fragments from pit 5, there are two from pit 3, one from pit 1, one from mound 17, pit 8, two from mound 17, basin 2, one from mound 17, basin 2, pit B, and one from mound 17, basin 2, pit C (pl. 34, *a*, *b*, *e–h*, *j*, *k*).

The purpose of these objects remains uncertain, though the perforations and notches suggest points of attachment for a string. As to the method of manufacture, I suspect they were sawed and split from the outer face of suitable lengths of antler rather than from ribs or other bones. The curvature then would be wholly natural. In none of our excavations, however, did we find any scarfed antler rejectage from which such strips might have been cut. The inferred method of detachment is discussed and illustrated by Kidder (1932, p. 272 and fig. 230).

*Needle fragment.*—This is a thick, curved, shaped, but apparently unfinished strip of antler, broken at one end, and retaining the rough cancellous tissue on the concave face. The other end has been squared off and dressed, as are the adjacent edges. About 8 mm. from this end is a long narrow eye, 8 by 2 mm., that has been cut or sawed rather than bored through. The specimen is 40 mm. long, 12 mm. wide at the butt, and 4 or 5 mm. thick. It may represent part of an unfinished needle for mat weaving.

### OBJECTS OF BONE

In striking contrast to the sites in eastern Kansas described in the preceding sections, the Tobias site presents a surprisingly extensive, varied, and interesting series of bone artifacts. (See table 4.) For the most part, moreover, the specimens are in good preservation. They are primarily utilitarian; other than beads and tubes for personal adornment, there is nothing that can be regarded as of esthetic or esoteric character. Many of the specimens, however, are very well made and carefully finished, and it is evident that the native craftsmen prided themselves on their work—probably to a far greater degree than did the later-day artisans in competition with the white trader and his wares. The local bone industry is of interest, too, in that it seems to lack certain characteristic late Plains artifact types at the same time that it presents others new to the area.

Most of the implements appear to have been fashioned by cutting, grinding, and rubbing, from the limb bones, ribs, and neural spines of such large mammals as bison, elk, and deer. Other than for beads and tubes, there seems to have been no utilization of bird bones. So

TABLE 4.—*Occurrence of bone artifacts at the Tobias site*

| Bone artifact | PITS | | | | | | | | | | | | Mound 4 | Mound 6 | Mound 17 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1A | 1B | 2 | 3 | 3A | 4 | 5 | 6 | 7 | 8 | 8A | | | Basin 1 | Basin 2 | Trench |
| Bison ulna pick | | | | | | 1 | | | | | | | | | | | |
| Awls | | | | | | | | | | | | | | | | | |
| Head unmodified (IB) | | | | | | | | | | | | | | | | 1 | |
| Head partly worked (IC) | | | | | | | | 2 | | | 1 | | | | | | |
| Split rib | | | | | 2 | | | | | | | | | | | 2 | |
| Face splinters | 2 | | 1 | | 1 | | | | 1 | | 1 | | | 1 | | 2 | |
| Rib edge | 3 | | 3 | | 5 | | | 3 | | | 5 | | | 6 | 2 | 10 | |
| Stemmed implements | | | | | | | | | | | | | | | 6 | 2 | |
| 4-sided implements | | | | | | | | | | | | | | | 4 | 2 | |
| Tapered cylindrical implements | | | | | | | | | | | | | | | 2 | 2 | |
| Bipointed implements | | | 2 | | 2 | | | | | | 3 | | | 1 | | 1 | |
| Polishing implements | 1 | | | | 1 | | | 1 | | | 1 | | | | | 1 | |
| Pointed split-rib implements | | | | | | | | 1 | | | | 2 | | | | 2 | |
| Arrow straighteners | | | | | | | | 1 | | | | | | 2 | | | |
| Scored implements | | | | | 3 | 1 | 1 | | | | 1 | | | 2 | 1 | 6 | |
| Cancellous paint brushes | | | | | 1 | | | | | | | | | | | | |
| Other | | | | | | | | | | | | | | | | 1 | 1 |
| Gambling chips | | | | | | | | 1 | | | | | | | | 1 | |
| Cut hyoid | | | | | | | | | | | | | | 1 | | | |
| Tubular beads and fragments | 1 | | 1 | | 7 | 1 | 5 | 2 | 4 | | 34 | 4 | 1 | 10 | 13 | 15 | 1 |
| Bone tubes | 4 | | 1 | | 3 | | | | | | 1 | 1 | | | | | |
| Cut bone ends (joints) | | | | | 1 | | | | 1 | | 3 | | | 1 | | | |

far as our observations go, there were no significant concentrations of types in certain pits or other units that might indicate manufacture by, or ownership within, a single household or family group. That is to say, examples of any of the following types can be expected to turn up in any part of the site where occupational debris has accumulated.

*Bison scapula digging tools.*—These familiar implements, or fragments of them, were found in all parts of our excavations, and were especially plentiful in the cache pits where they probably outnumber all other artifact categories. Most of the specimens are incomplete; where identification is possible, all the bones seem to be bison. The series, numbering upward of 60 pieces, includes not more than 4 or 5 distal extremities, suggesting that this part of the bone was usually removed and the resulting stump but slightly smoothed down. In all cases, the scapular spine has been hacked off, as also the ridge along the posterior or axillary border; very rarely has there been any effort to smooth over the irregularities left by this trimming process or to bring the ragged scars so left flush with the blade. The proximal one-third or one-half of the scapula, including the entire vertebral border, was invariably cut off, usually leaving a more or less straight working edge, less commonly a rounded one. The finished tool, thus, would be subtriangular in outline, with rounded angles and rarely with the short side convexly curved. The working edge commonly has a short steep bevel, is sometimes worn back to a concave line, and on many specimens bears a high polish from extended use. There is no notching or grooving on most of our specimens, and I cannot say what the manner of hafting was. The two largest examples are 31.5 cm. long, with widths of 11 and 16 cm., whence they range downward in size to 16.5 by 8.5 cm.

One incomplete digging tool from pit 8 is of exceptional interest by reason of its "non-plains" manner of hafting. In this specimen no attempt was made to remove the head. From the glenoid cavity a deep groove or socket has been excised about 7 mm. down the dorsal surface; the ventral margin of the cavity has been battered and chipped, whether in connection with the socketing or subsequently I cannot be certain. The working edge, of which only a portion remains, is beveled and highly polished; and the scar left in removal of the scapular spine has been rubbed down with some care. The total length of the artifact is 24 cm. I am unable to find record of similar socketed digging tools in other archeological horizons in the Plains area, but as we shall see presently, they do occur farther south in the Arkansas drainage.

*Bison ulna pick* (?).—A single specimen is recorded from the site, coming from pit 3A. The rugosities where the ulna was detached from the radius show unmistakable polish from use, and the tapering distal end appears to be battered and somewhat blunted from use. There are no other convincing signs of wear on the object. So far as I know, there is no historical reference to these tools, and their identification as picks rests on inference alone. The broad upper end would have made a very convenient hand grip, and the stout point would have been serviceable in any hard-dirt excavating.

*Awls.*—There are 62 whole and fragmentary implements identified as awls; they come from nearly every one of our excavation units. Discounting 8 very fragmentary and unclassifiable specimens, 4 are of split mammal leg bone, 13 are of rib, and 37 are of neural spine; there are apparently none of bird bone.

Split leg-bone awls include one sturdy well-made specimen, of deer or antelope metapodial, in which the head of the bone has been unmodified except by the original splitting; it measures 14.5 cm. long, and is from mound 17, basin 2. In three other well-worn specimens, the joint ends have been partly ground down after splitting; two are from pit 5, one from pit 8, and length ranges from 6.7 to 12.8 cm. (fig. 46, *a*, *b*; pl. 32, *j–l*).

Rib awls are of two kinds: four specimens are made of the hard inner or outer surface layer of a split rib. One face thus is flat and smooth, the other shows more or less cancellous tissue; the edges have been rubbed down, the butt rounded off, and the other end sharpened to a point (fig. 47, *a*; pl. 32, *n*). These implements are from 8.3 to 13 cm. long, and from 1.3 to 1.9 cm. wide; two came out of pit 3, two from mound 17, basin 2. Nine other specimens are apparently splinters from the face, or face and edge, of ribs; they are irregular in form and size, generally showing no modification other than the shaping of one end to a sharp point. They range in length from 2.9 to 12.4 cm.

Far more abundant and characteristic than any of the preceding are awls cut from the edge of a large rib or neural spine. Typically, these taper more or less evenly from butt to tip. In cross section, they are subtriangular with the angles rounded; the butts are either rounded or subpyramidal. Two sides, representing the converging surfaces of the bone, are invariably smooth; the third, except in the smallest specimens, usually still retains some traces of the cancellous interior tissue of the bone. Complete specimens range from 6.8 to 15 cm. in length. They apparently conform in all respects to the "edge of rib" awls found at Pecos by Kidder (1932, p. 217), but the contours of some of the larger and less extensively altered specimens from Tobias suggest strongly that they were cut from the anterior margin of the neural spine of the bison. None of the specimens show any trace of the slight curvature characteristic of a rib (fig. 47, *b*, *c*; pl. 32, *e*, *i*).

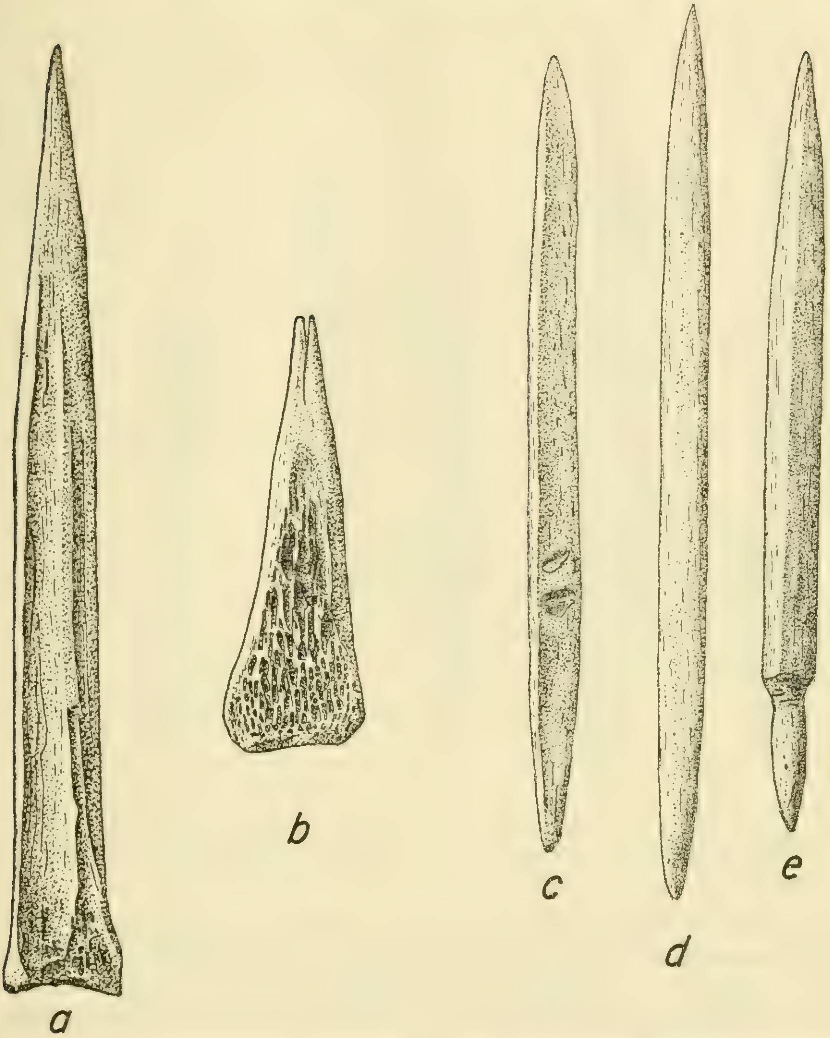

FIGURE 46.—Bone artifacts from Tobias site. *a, b,* split leg-bone awls; *c,* 4-sided implement; *d, e,* projectile points. Length of *a,* 14.5 cm.

Elsewhere in the Central Plains, split-rib awls have been reported from 25CH1, a Dismal River culture site in Chase County, Nebr. (Hill and Metcalf, 1942, p. 196) ; the triangular type is reported from the same site, and also from the Burkett, Wright, and Gray-Wolfe sites on the Loup (ibid., p. 197; Dunlevy, 1936, p. 197 and pl. 13, *b–d*).

*Stemmed implements.*—There are eight of these. They are approximately square, quadrilateral, or subcircular in cross section, evenly tapered at one end to a thick point and provided at the other end with a constricted, usually well defined stem (pl. 33, *e, h–j*). All are well formed and have been carefully rubbed down. In cross section, one

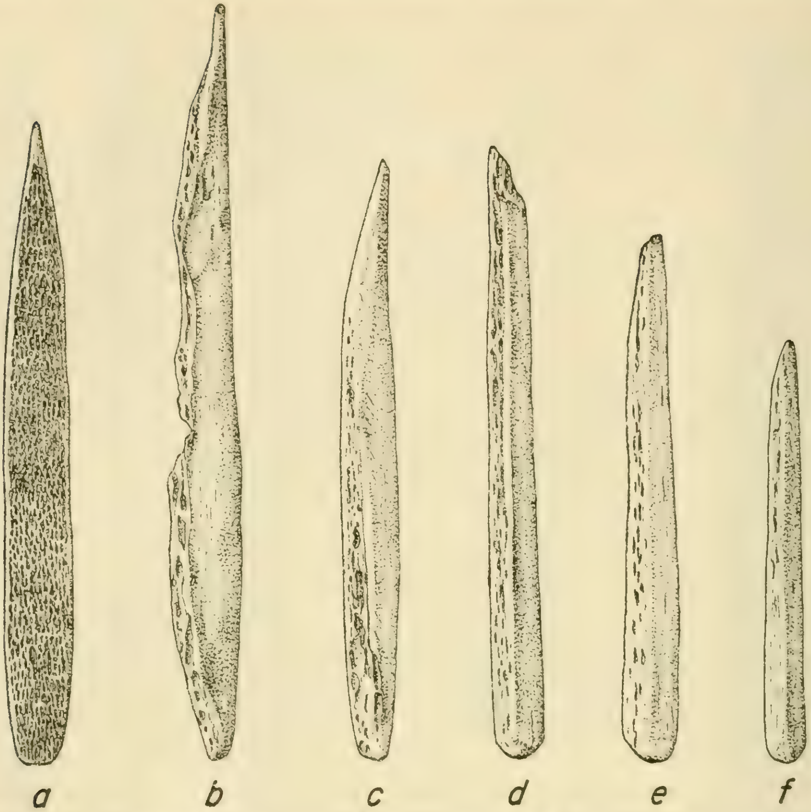

FIGURE 47.—Bone awls and polishers(?) from Tobias site. *a*, flat split-rib awl, length 12.7 cm; *b*, *c*, awls from edge of neural spine; *d–f*, awls or polishing tools from edge of neural spine or rib.

short side or edge usually is a trifle thicker than the other, and in at least two specimens this thicker edge is partially surfaced with cancellous tissue. From these features, I suspect that the implements, like the typical triangular-section awls, were cut from the anterior margin of the neural spine of the bison. They vary in overall length from 6.3 to 12.6 cm.; with a maximum diameter of 6.5 to 10 mm.; the stem is 11 to 23 mm. long, separated by an abrupt shoulder from the blade. All of our specimens are from the mound 17 complex: six from basin 1, and two from basin 2 (fig. 46, *e*).

There is no obvious reason for doubting that these objects represent projectile points, intended for mounting in a hollowed foreshaft or reed arrow. Similar specimens have been reported from the Burkett and Wright sites in Nance County, Nebr. (Dunlevy, 1936, pl. 13, E, and p. 197; Hill and Wedel, 1936, p. 58) and from the Lovitt site, 25CH1, in Chase County, Nebr. (Hill and Metcalf, 1942, p. 199 and pl. 9, fig. 2, A and D). These sites are all on the protohistoric level,

i. e., early European contact; I know of no prehistoric occurrence of the type in the Central Plains. Kidder (1932, p. 240 and fig. 200, c) reports a closely similar specimen from late Glaze III (ca. 1475–1550) deposits at Pecos.

*Four-sided implements.*—These objects, six in number, are square, square with rounded angles, or quadrilateral in cross section (pl. 33, *a–d*). One end has been shaped to a thick sharp point, which may retain the square form and angles of the shaft; the other is rounded off, and has had the angles rubbed down. One specimen is polished on all surfaces; the others, though shaped with much care, still bear faint longitudinal striations on their flat or slightly rounded sides. Two still exhibit faint traces of cancellous tissue along the midline of one side, suggesting that they, and probably the others as well, were cut from the neural spine of the bison. They are somewhat better made and more symmetrical than the stemmed implements. The blunt and rounded end, which in no case shows the abrupt shoulder of the preceding type, nevertheless suggests modification for insertion into a socket or hollow shaft, and these specimens may also represent projectile points. They range in length from 9.8 to 13.5 cm., and in maximum diameter from 7 to 8 mm. As with the stemmed implements, all are from the mound 17 complex: four from basin 1, two from basin 2 (fig. 46, *c*).

There appears to be no published record of comparable forms from other sites or horizons in the Plains area. At Pecos, however, closely similar specimens were found "at all levels except those of definitely historic period" (Kidder, 1932, p. 225 and fig. 198).

*Tapered cylindrical implements.*—This group comprises four specimens; two are from mound 17, basin 1, and two from mound 17, basin 2. All are circular, or very nearly so, in cross section. They taper evenly toward both ends, one of which is pointed, the other rounded; all are very well finished and remarkably symmetrical (pl. 33, *k*). The smallest specimen, which differs slightly in form and proportions, shows cancellous tissue along one side; the others do not. Length varies from 8.3 to 13.8 cm., maximum diameter from 6 to 9 mm. (fig. 46, *d*).

From the blunted butts of these objects, which differ only in cross section from the four-sided implements, I suspect that they may also be projectile points. They have not been reported, apparently, elsewhere in the Plains; a possibly similar artifact from Pecos, described only as a "Double-ended implement, round in section" is illustrated by Kidder (1932, fig. 200, f).

*Bipointed implements.*—Included here is a rather variable series of nine objects, characterized by relatively small size, generally good finish and shaping, and by two pointed ends (pl. 33, *o–t*). Cross sections vary from subcircular to subtriangular to flattened. Two or three show cancellous structure on one side, but most have been smoothed on all sides. The ends are variable: one is commonly more rounded or more abruptly tapered, than the other, and one or both may be flattened or otherwise asymmetrical. They vary in length from 3.8 to 8 cm., and in maximum diameter from 3.5 to 6 mm. The larger specimens suggest projectile points of the tapered cylindrical type, but others are too small or seem too asymmetrical for such use. Gorge hooks might be suggested except that there is no evidence for the use of fish in the bone refuse from the site. The series probably includes implements of widely diverse uses, none of which are obvious to me. As to provenience, specimens came from three pits, from mound 6, and from mound 17, basin 1.

*Polishing* (?) *tools.*—Here are included, with some uncertainty, five specimens of two distinct types. Three have a subtriangular cross section, nicely rounded butts, and show traces of cancellous structure along one flat side (pl. 32, *a–c*, *g*, *h*). In these features they are identical with the commonest type of awl from the site (p. 252). They differ, however, from what I have classed as awls in having blunt tips, with one or more flattened wear facets or else with fine diagonal striations (fig. 47, *f*). As piercing tools they would not seem to have been very effective, and the evidences of wear suggest a sidewise rubbing motion. It is possible that some of the implements counted as awls should be included here, since the two types intergrade (cf. Kidder, 1932, p. 229).

Two other polishing (?) tools are made of sections of animal rib. One, apparently the hard outer surface with faint traces of cancellous tissue on one side, is 11 cm. long and tapers at each end to a thick rounding point with worn edges. These points would seem much too heavy and blunt for piercing, and the wear faces indicate that the edges of the points were the working part. The second piece is irregular, with blunt flattened and worn ends; it is 10 cm. long.

*Pointed split-rib implements.*—There are five of these, all of bison or elk rib. Two consist of 10 or 11 cm. sections of whole rib, cut or else broken off at one end, and provided at the other end with a flat heavy point 6 or 7 cm. long. This point was made by transversely and deeply scoring one surface, splitting away the rib face beyond the scoring, and then tapering the remaining single face of the rib. The unsplit section is of convenient size and thickness for grasping, and I suppose represents a grip. For what purpose these implements were intended I do not know, but the sturdy points and grip suggest heavy duty tools (pl. 36, *d*).

From mound 17, basin 2, came a specimen 23 cm. long, split from the convex outer face of a rib, and tapering to a long use-polished point. The edges have been smoothed, and transverse grinding striae remain on both surfaces; an unknown length at the butt has been broken away. There is a slight indentation on each edge 45 to 70 mm. from the wide end. Maximum width of the piece is 19 mm. (pl. 36, *e*). From pit 5 came a heavy, much worn point of split rib, 10 cm. long and 18 mm. in maximum width. The cancellous surface and edges have been worked down. The point is much heavier than the usual bone awls, and to me suggests the working end of another long flat implement like the preceding.

The remaining specimen is made from the concave inner surface of the split rib. The edges have been ground down, but not smoothed or polished. One end rounds off into a thin flat point; the other is broken but may once have tapered in somewhat similar fashion. On the cancellous surface there has been just enough smoothing to remove any sharp edges. The specimen measures 23.5 by 5 by 2 cm.; there are no wear facets to suggest the manner of use.

*Arrowshaft straighteners.*—These implements, of which we found one complete and two fragmentary specimens, were made from sections of bison or elk rib (pl. 36, *a*). The complete specimen, from pit 3, is 27.5 cm. long; both ends of the original rib were unevenly broken off, and the fractured edges smoothed. Eleven cm. from the narrow (proximal) end is a hole 8.5 mm. in diameter. On the inner surface of the bone the hole is slightly elongate toward the distal end of the rib; on the outer surface it is similarly worn toward the proximal end. Such wear would result if the user, holding the wrench in his left hand with the concave surface to the right inserted a shaft with his right hand and then exerted the necessary pressure by bringing both hands together. There are numerous fine striations and two deeper cuts on the concave surface of the implement; on the convex surface are 3 or 4 transverse cuts and a number of faint, more or less evenly spaced, notches suggesting that the specimen had been marked off originally for a "rasp" and was then converted before completion to another use. Both surfaces are worn from much handling.

The two fragments are from mound 6, and possibly represent a single specimen, but they cannot be satisfactorily fitted together. Both are from a split rib section: one is from the outer convex surface, the other from the inner concave surface. One fragment is 12 cm. long; at the center is an 8-mm. hole, very slightly elongated by wear along the longitudinal axis of the bone. The second piece is 6.5 cm. long; at one end it has been broken off through an 8.5-mm. hole, the remaining half of which is similarly worn.

The bison-rib shaft straightener is a common and widespread type in the Plains, having been reported by various observers in numerous sites from Kansas to North Dakota and Montana (see, e. g., Wedel, 1935, pp. 202, 232; Strong, 1935, pp. 249, 261; Wedel, 1936, p. 82; Hill and Wedel, 1936, p. 55; Hill and Metcalf, 1942, p. 199; Cooper, 1936, p. 54; Dunlevy, 1936, p. 197; Champe, 1936, p. 268; Will and Spinden, 1906, p. 170; Strong, 1940, pp. 370, 375; Mulloy, 1942, p. 72). It has recently been suggested (George and George, 1945, p. 65) that perforated rib implements with perfectly round holes were arrowshaft gages, those with worn holes thong dressers. If this is a valid distinction, most Central Plains specimens, since they show wear facets, would have to be regarded as thong dressers. On the other hand, shaft straighteners of antler have been reported ethnographically for the Omaha (La Flesche, 1924), and it is a reasonable inference that on the Plains proper an analogous form of bone, like those under consideration, served the same purpose. Prolonged use as a wrench would inevitably produce wear facets along the longitudinal axis of the holes. Moreover, since breakage is often transversely across one of the holes, I think they were subjected to a much greater strain than would be caused by the to-and-fro action of a thong. It is possible, and even probable, that the implements served more than one use. Parenthetically, it may be noted that of 87 Arapaho, Kiowa, Sioux, Comanche, and Shoshone arrowshafts which I measured in the Division of Ethnology, United States National Museum, 67 specimens (77 percent) were under 8 mm. in maximum diameter, and thus could be conveniently accommodated by any of the arrowshaft straighteners in our archeological collection from Kansas.

*Scored implements.*—There are 14 fragments of bison or elk rib, bearing deep parallel transverse cuts more or less evenly spaced along the outer surface of the bone; the cuts usually end short of, or just at, the lateral edges of the rib. In three specimens the grooves appear to be slightly deeper at the sides of the rib than along the midline, where a somewhat worn zone suggests the use of a rubbing stick. On the majority, however, no such action is indicated. Unfortunately, none of the specimens appears to be complete, and so the total length of the scored surface originally can in no case be stated. The fragments range in length from 3.5 to 34 cm., and bear from 5 to 42 scorings. The intervals between scorings vary considerably. The longest specimen, 34 cm., has 18 grooves distributed over a 17-cm. section of the surface; it possibly has all of the original grooves (Wedel and Hill, 1942, pl. 10, c). The next longest example, 31.5 cm., has 42 cuts covering 22 cm., and the grooves apparently continued for an unknown distance beyond the fractured distal end of the bone. The closest scoring occurs on a fragment from pit 3, which has 30 cuts in 8 cm. Cuts per centimeter of scored surface thus range from one to nearly four, with about half the specimens averaging just under two to just over three. We have 6 examples from 4 pits, two from mound 6, and one and five, respectively, from basins 1 and 2 in mound 17 (pl. 31, *a*, *b*, *d*).

In addition to the above, there is one neural process of a bison which has five unevenly spaced scorings on one lateral surface near the distal end. It is 28 cm. long, and was found in mound 17, basin 2 (Wedel and Hill, 1942, pl. 11a).

Transversely scored rib implements of the type described above have been found (Wedel and Hill, 1942, p. 96) at several protohistoric and historic Pawnee sites in Nebraska; at Dismal River culture sites in Scott County, Kans., and Frontier County, Nebr.; at most of the protohistoric sites so far tested in central and south-central Kansas; but not, so far as I know, in the Woodland, Upper Republican, Nebraska Culture, or other prehistoric horizons of the Central Plains. Their wider distribution has not been fully worked out; and it appears that the published record by no means accurately or fully indicates their range. Northward, they have been reported archeologically at least as far as the Leavenworth (Arikara) site near Mobridge, S. Dak. (Strong, 1940, p. 370). To the south and southwest, they occur in late prehistoric sites of the Texas Panhandle culture, where adequate descriptions are unfortunately lacking (Holden, 1933, p. 48; Studer, 1934, pp. 90–91; Johnston, 1939, p. 197). Kidder (1932, p. 252 and fig. 212, d–f) notes their occurrence in Glaze III–V levels at Pecos, and Hodge (1920, p. 139 and pl. 44e) records a somewhat similar but not identical piece from Hawikuh. Eastward, they occur sporadically in a few Oneota sites, though not apparently at Leary or Fanning; and at Madisonville, Ohio (Hooton and Willoughby, 1920, p. 62). They would appear, on present evidence, to be rather more plentiful perhaps in the Central Plains than in surrounding areas; and in and near the Plains, at least, they seem furthermore to belong to a relatively late period.

At Pecos, Madisonville, in the Texas Panhandle, and elsewhere these implements have been identified as musical rasps, and it is possible that some of the Central Plains specimens can be similarly classed. The wear on some of the specimens from the Tobias site is greatest along the midline, where the edges of the grooves have been considerably modified by the action, inferentially, of a stick or bone drawn across the scored surface. For what purpose a stick would be so applied to the grooved surface, unless for rhythmic or musical effects, I do not know. So far as I am aware, there is no historical or ethnographic description of a musical instrument in the Central Plains that unquestionably applies to the transversely scored ribs rather than to, say, an edge-notched stick. Roberts (1936, p. 24, fig. 5) ascribes a notched stick or bone rasp, used without resonator, to the Omaha and neighboring Plains tribes; and Dorsey (1904, p. 17) says that the Wichita kept time for certain chants by "the drawing of a stick over a notched club, one end of which rested on a buffalo rawhide resonator." It thus appears that some type of musical rasp may have been known in the central Kansas-Nebraska area; and it is possible that the instrument may occasionally, or at one period, or among some groups, have been made of transversely scored animal ribs.

Elsewhere (Wedel and Hill, 1942) it has been suggested that some of the Plains specimens have few notches, are quite small, and lack any evidence of unusual wear on the scored surface; and that, on the other hand, they produce in plastic clay a ridged effect indistinguishable from that on much of the simple-stamped pottery from the same sites. I am still of the opinion that some of the scored ribs may have been used in surface texturing of pottery; and the few-scored neural processes and occasional paddle-shaped scapula objects seem to me to be far better suited to pottery stamping than to producing of musical or rythmic effects. The manner in which they occur in sites no more strongly supports their identification as musical instruments than it does the suggestion that they were pottery-making tools.

*Cancellous bone implements.*—There are three of these. One, from pit 3, is wedge-shaped, with one edge nearly straight and the periphery otherwise forming a partial ellipse. At one edge is a small area of the hard outer layer; otherwise, the piece is entirely of cancellous tissue (pl. 36, *g*). It measures 68 by 50 mm., and has a maximum thickness of about 10 mm.; the edges are thinned down to about 1 or 2 mm., which is about as thin as the spongy texture of the bone permits. The bone is probably from the head of a bison femur or from the neural spine, in any case certainly not from the nose bone of the bison, as has been erroneously supposed. The specimen closely resembles the paint applicators used by some historic Plains tribes for decorating tipi covers and other articles of skin (Fletcher and La Flesche, 1911, p. 354 and fig. 78), though there are no traces of coloring matter in the interstices. Similar objects have a fairly wide distribution in the Plains, and most of those so far reported archeologically appear to be from protohistoric and historic horizons (Will and Spinden, 1906, p. 171; Wedel, 1936, p. 82; Dunlevy, 1936, p. 199; Hill and Metcalf, 1942, p. 199; and this bulletin, p. 581). At Pecos, Kidder (1932, p. 238) records the same type from late levels, noting further the absence of paint traces and pointing out the suitability of the objects for hide scraping.

The second object of cancellous bone from the Tobias site is a small irregular subspheroidal piece measuring 33 by 36 mm. There can be no doubt that it has been shaped by man, but I am unable to suggest its possible purpose. It was found in mound 17, basin 2, pit D.

The naturally rounded head of a bison humerus or femur, with a slightly concave smooth-worn cancellous under surface, appears to have served as a hide-rubbing tool, as it is known to have done in later historic days on the Plains (fig. 48).

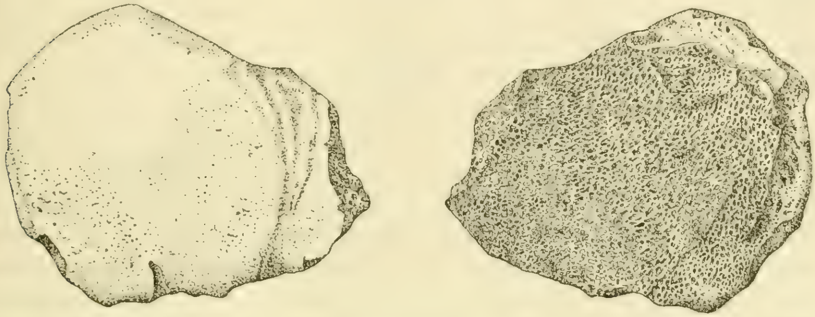

FIGURE 48.—Top (left) and bottom views of bison epiphyseal hide-rubbing tool, Tobias site. Length, 10.2 cm.

*Gambling chips* (?).—Two oblong objects, each with one surface of smoothed dense bone, and the other with traces of cancellous tissue, have rounded ends and dressed edges, but otherwise were not finished with especial care. The larger specimen, measuring 17 by 55 mm., has numerous fine striae on the smooth surface, but without any suggestion of a pattern. The other has traces of red pigment on the cancellous surface, and faint transverse striae more or less grouped near the middle and again towards each end of the smooth face. In form and size these objects resemble the incised Mandan gambling chips figured by Brower (1904, p. xvi); painted surfaces may here have served in lieu of incising. On the other hand, it is quite possible that these objects had nothing to do with gambling (pl. 35, *i*, *j*).

*Cut bison hyoid.*—One specimen came from mound 6. Both extremities have been carelessly and unevenly detached. The flat surfaces are moderately well polished and there are rodent toothmarks on one edge. The piece, whose purpose I cannot guess, is 77 mm. long; it may represent an unfinished artifact. A similar but better finished specimen, pierced lengthwise, was found by us in Scott County State Park (p. 454).

*Incised bone strip.*—From mound 17, basin 2, pit C, were taken three thinly scraped slightly curved strips of bone, with dressed edges and broken ends; the concave surface of each is faintly cancellous. All are from 1.5 to 2 mm. thick, 8 or 9 mm. wide, and from 24 to 33 mm. long. The shortest piece has been turned ashy-white by fire; it has 2 parallel incised lines running lengthwise along one edge. A second fragment, 26 mm. long, has 7 tiny nicks on one edge, and deep narrow lines erratically incised on a very well polished surface. The third piece, 33 mm. long, is also highly polished and has three erratic deeply incised lengthwise lines. One of the outer lines is crossed by five short transverse cuts, grouped as four near one end and one near the other. Faint but unmistakable traces of red pigment are visible on both the polished fragments, in the incisions and also in the cancellous tissue. The second and third pieces may be from the same original specimen, the first less probably so; but it is impossible to determine the length, shape, and purpose of the object or objects represented.

*Tubular beads.*—Small dressed cylinders cut from hollow bone, and not exceeding 9 mm. in diameter or 63 mm. in length, are here classed as beads (pl. 35, *c*, *d*, *f*). They were made by sawing a deep groove around the shaft of the bone near each end, and then snapping off the articular extremities. Six such extremities, each with a short stub of cleanly severed shaft, were found; they range downward in size from that of a turkey, but beyond this the species used are not identifiable. The cut ends of the cylinders were neatly smoothed; the surfaces, undecorated, show varying degrees of polish from use. Our smallest specimen is 1.5 by 10 mm., whence the others range upward in diameter and length as shown in the accompanying chart. Length varies from twice to ten times the diameter. The standard form would seem to be 3 to 6 mm. in diameter by 12 to 38 mm. long. Two specimens each have a discontinuous encircling groove or series of cuts near one end, suggesting the beginning of an attempt at severing part of the tube; another, 45 mm. long, has a deep encircling groove about 12 mm. from one end, and a single short shallow cut about the same distance from the other end. Scattered specimens came from nearly every part of our excavations, indicating that they must have been in general use. In only one instance, however, did we find a number of them in what undoubtedly approximated their original associations; this find, a necklace, has been described in another place (p. 296), and is not included in table 5.

TABLE 5

| Length / Diameter | 0–12 mm. | 12–25 mm. | 25–38 mm. | 38–51 mm. | 51–63 mm. | Total |
|---|---|---|---|---|---|---|
| 0–3 mm | 3 | 12 | 4 | | | 19 |
| 3–6 mm | 3 | 39 | 7 | 7 | 1 | 57 |
| 6–9 mm | | 9 | 2 | 3 | | 14 |
| Total | 6 | 60 | 13 | 10 | 1 | 90 |

Bone beads of generally similar type have been found at a number of sites in the Plains, but usually, it would appear, in comparatively small quantities.

*Bone tubes.*—Two comparatively short thick tubes came from pits 1 and 13. One is highly polished, with somewhat irregular ends, and a subtriangular cross section. On the ridge forming the apex of this triangle are 10 notches, and at one end, 3 incised lines cross the ridge and extend down each side (pl. 35, *e*). The specimen measures 14 by 45 mm. The other tube, 11 by 62 mm., is smoothed, and has unevenly cut ends, with a few scratches at one end, but no decoration.

Very different are several long slender tubes apparently cut from the radii of large wading birds. From pit 1 came two such specimens exhibiting complementary curvatures and obviously a matched pair. They are plain, well polished from use, with a length of 125 mm. and maximum diameter of 5 mm. The articular surfaces are missing, but in size, conformation, and curvature the specimens are identical with radius shafts of the great blue heron (*Ardea herodias*);[21] very likely they are fashioned from the radii of a single bird. A similar but slightly smaller (100 by 4 mm.) specimen came from mound 17, pit 8; and shorter but similarly curved and worked radius segments were found in pits 3 and 8A. Just how these long tubes were used is not clear, but presumably they were for personal adornment (pl. 35, *a*, *b*).

There is also one slivered fragment of thick-walled mammal bone tube from pit 1; it was partially sawed through and then snapped off. It measures 65 by 12 mm.

*Miscellaneous objects.*—This includes a varied series of worked specimens which on present evidence do not seem to constitute well-defined types.

An irregular curved slab 105 mm. long by about 16 mm. wide, cut or broken from heavy mammal bone, has had both long fracture edges smoothed, and the slightly broadened spatulate end ground from both sides to a cutting or scraping edge 20 mm. wide. It was found in mound 6.

Several small fragments of bison scapulae, possibly readapted bits from broken digging tools, have had the broken margins rounded off slightly as though to give a more convenient grip. The cutting edges, sometimes beveled, would have served nicely for scraping, rubbing, or smoothing some moderately soft substance, or for slicing up squash or similar vegetables.

A large irregular fragment from the anterior surface of an elk metatarsal has had the vascular groove artificially deepened by narrow U-shaped scoring. Both lateral surfaces are highly polished and bear deeply cut Y, V, Λ, single line, and other incisions; these run to the broken edges, and may once have continued onto a larger portion of the bone surface that has since broken away. The fragment measures 105 by 30 mm.; it came from mound 6 (pl. 34, *l*).

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[21] I am indebted to Dr. Herbert Friedman of the National Museum staff for this identification.

A highly polished cylindrical fragment 58 mm. long by 5.5 mm. in diameter has one end pointed and the other rubbed down after fracture. On one side are two groups of transverse cuts, with 4 and 2 cuts per group. Opposite the group of 4 is a small neatly cut X; beside and just above the group of 2 is another X, and on the opposite side is a third X. Near the refinished butt are 2 more short cuts. The specimen somewhat suggests the bipointed objects or the projectile points (?) described above, and is as well finished as any of them. It is unique in having the paired cuts and crosses. It was found in mound 17, pit 8A.

The distal extremities of two cervid cannon bones, probably deer, have been cut and snapped off from the shaft. One, from mound 17, pit 8, shows no further modification. The second, from pit 8, shows artificial deepening and lengthening of the vascular groove; on the opposite surface is a deep straight cut that reached the cancellous tissue, with a shallower paralleling groove. Both specimens are undoubtedly rejectage; and the grooving on the second piece suggests steps in the splitting of the bone for awl-making.

Other cut, smoothed, and shaped fragments are too small and nondistinctive to merit detailed treatment here. They include about 20 butt and tip fragments of unclassifiable awls, the midsection of another four-sided implement, scapula fragments, etc.

### OBJECTS OF CHIPPED STONE

Among our collections from the Tobias site, chipped-stone artifacts rank in abundance immediately below pottery remains. The variety of types is not great, but adequate samples are generally available. Workmanship is good, sometimes superior, and many of the specimens are excellent examples of the stone-flaker's art. In general, the projectile points, drills, certain forms of knives, and scrapers are at least the equal of any chipped-stone implements produced at other Plains sites, and they illustrate rather well the degree of competence attained by native craftsmen before the introduction of more efficient metal products.

In part, of course, the raw materials used were responsible for the high quality of the finished products. These included brown jasper, apparently not particularly well suited to fine retouching; gray, white, pink, and variegated cherts of uncertain origin; pink, brown, or gray Florence flint, often attractively banded and characterized by fusulinid and other fossil inclusions (see also p. 476); chalcedony and moss agate, perhaps from somewhere to the west or northwest; and a little obsidian. This last, inferentially, was imported from the New Mexico region; none of the spalls, cores, and flakes that came to our notice exceeded 50 mm. in greatest dimension, and most were much smaller. Thirty-one pieces of obsidian, but no finished artifacts, came to light, and since they occurred in several pits and all of the mounds we opened, it can be concluded that the material was well known locally. Because of the distance involved in its acquisition, and also because of the excellent cherts abundantly available from nearer sources, obsidian never could have been utilized to the extent warranted by its inherent superiority.

In the following discussion, I have found it convenient to follow Kidder's (1932, p. 15) outline for Pecos chipped stone, which treats first artifacts with secondary chipping (projectile points, drills, beveled knives); then artifacts with no secondary chipping on one or more major faces (end and side scrapers); and finally, artifacts with no secondary chipping (axes and other implements).

*Projectile points.*—Of 210 specimens classed as projectile points, 178 (85 percent) are small triangular forms with or without notches. These occurred everywhere in our excavations and undoubtedly represent the standard type. Unnotched specimens decidedly predominate, there being 134 (64.1 percent of all) of them. The base varies from straight to very slightly concave or convex; maximum width is across the base, whence the straight or slightly convex edges taper evenly to the tip. The cross section is flattened lenticular. Flaking is generally very good and, save in two or three specimens, covers both faces. Length is from 14 to 34 mm., width from 9 to 17 mm., thickness from 2 to 4½ mm.; the ratio of width to length varies from 1:1 to 1:3.4 with 1:2 probably near the average figure (pl. 37, *a–i*).

Conforming in most particulars of size, shape, and workmanship to the above, were 38 points (18.1 percent of all) provided with two lateral notches from 4 to 8 mm. above the base. Here again maximum width is across the base, which is usually faintly concave; slightly convex edges decidedly predominate over straight. Six other specimens (2.9 percent of all) have a single basal notch in addition to the lateral pair (pl. 37, *j–n*).

Less numerous, but still occurring in nearly all parts of the workings, were 14 cruder points. These vary from subtriangular with greatest width at the base (6 specimens) to broadly leaf shaped with maximum width one-fourth to one-half the distance above the base (8 specimens). They are much thicker (4.5 to 7 mm.) than the foregoing, and have coarser chipping which is usually restricted on one or even both faces to the margins. The points also tend to be misshapen and asymmetrical, often retaining the curvature of the original flake. They are also larger: width is 13 to 20 mm., length 21 to 38 mm. It is possible that these shoddy specimens were not even intended as projectile points, though their general shape and size suggests some such use.

The remaining 18 points comprise two groups of rather distinctive character. The first group includes 1 incomplete and 10 whole specimens that are basically triangular, with the greatest width across the usually concave base; the edges curve evenly from base to tip, and the cross section is lenticular. Each has a pair of deep, narrow, lateral notches 7–18 mm. above the base. The edges are minutely retouched; elsewhere, the chipping is coarser than in the small points, but still of good quality. They are well made and symmetrical, are of the usual materials for the site, and look like large-scale copies of the small notched points. Length is from 34 to 94 mm.; width, from 21 to 36 mm.; thickness, from 5 to 8 mm. (pl. 37, *o*, *p*, *r;* fig. 53, *a*).

Ten of the above points are from basin 1, mound 17; the eleventh, cataloged as from "loose earth at east end" of basin 2, may actually have come from the immediately contiguous part of basin 1. Whether all actually served as projectile points, I cannot say; our best example, of chalcedony (pl. 37, *o*), seems too fragile to have been so used. The basal half of one and the tip of another have a carbonaceous adhesion suggesting burnt pitch, resin, or grease.

The second group includes 7 stemmed specimens, all from basin 2. Though variable in size and other details, they are somewhat smaller, cruder, and proportionately heavier than the foregoing. Length is 32 to 60 mm.; width, 18 to 34 mm.; thickness, 5 to 9 mm. They are characterized by a relatively broad, thick blade with convex edges and well-marked shoulders, deep corner notches that produce an expanding stem, and a base that is usually convex (5 specimens) or slightly concave. The flaking is coarser than on most other specimens from the site. All specimens have the blade edges ground down, and in most cases are so blunted as to be useless for cutting or penetrating—a curious feature not noted on any other projectile points from the site. The blunting, if not deliberate, probably resulted from use of the blades as scrapers or reamers, i. e., with a sidewise rather than lengthwise (or cutting) motion. They may have been specialized tools whose resemblance to projectile points is incidental. They are, however, reminiscent of a widespread Plains type (cf. pl. 37, *q*, *s*) of Woodland point and there is a chance they were not made at the Tobias site but were picked up on some older campground and readapted to another use by the later peoples. I am unable to suggest a plausible explanation for their restricted occurrence in basin 2, or for the similarly limited occurrence of the large notched triangulars in basin 1. In both basins, as for the site generally, smaller usually unnotched forms were characteristic.

*Drills.*—On the basis of form, the 93 objects classed as drills from the site may be divided into two major groups, viz, (*a*) plain-shafted drills, and (*b*) drills with shafts widened at base. Specimens belonging to the first group, which comprises two-thirds of the total, have the maximum diameter at or near the middle, whence they taper evenly in each direction to a rounded (originally pointed?) tip. Large, heavy examples predominate; they are from 51 to 120 mm. long, 8 to 15 mm. in maximum width, and 7 to 10 mm. thick, with rhomboidal or lozenge-shaped cross section. Neither end shows any specialization; wear occurs about equally on both ends and all along both edges, the latter being generally so blunted by use as to be quite ineffectual today for cutting or scraping. The size, length, and general conformation of a number of these tools is such that they fit nicely into stone pipe bowls of the local varieties, and the very marked degree of wear on the blade edges argues for just the sort of motion involved in drilling or reaming out pipe cavities (cf. Udden, 1900, p. 47). There is no indication that, or how, these objects were hafted, though the possibility exists that they were mounted, perhaps like projectile points, on wooden shafts. It should be noted that the overwhelming majority of these heavy-duty drills came from basin 2, mound 17, and in lesser numbers from the pits, and that over half are broken specimens (pl. 38, *h–m;* fig. 49, *a–c*).

Nine specimens, including 6 fragments, resemble the above except that they have at one end a thinned stem 7 to 13 mm. long that is

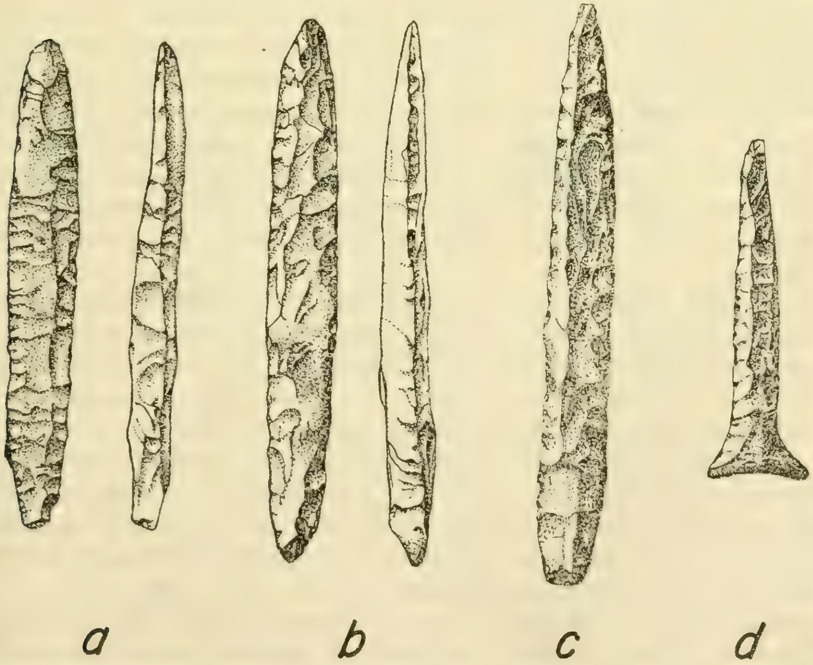

FIGURE 49.—Plain-shafted and T-shaped drills from Tobias site. Length of *b*, 11 cm.

set off from the blade by well-marked shoulders. The blade edges are worn smooth, but the stem edges are not. One specimen has side notches instead of a stem. Complete examples are 54 to 88 mm. long, in other dimensions like the foregoing (pl. 38, *b–g*).

Three smaller drills each have one pointed and one rounded end. On the pointed end, 10 to 12 mm. long, the chipping is fresh and unworn; elsewhere, the remaining portion has worn edges. These, too, are classed here as stemmed forms on the assumption that the uneven point was designed for mounting in a socketed shaft. Length is from 35 to 39 mm.; width, 6 to 9 mm.; and thickness, 3.5 to 4.5 mm.

Drills of the second group, 21 in number, are much more variable in form. In contrast to the basically rodlike build of the preceding varieties, these consist of a slender shaft with slight, moderate, or marked flangelike enlargement at the base. They are generally more delicate and were evidently designed for less strenuous jobs. Four specimens, otherwise with little in common, widen gradually from a retouched point to the butt (pl. 39, *o*). Twenty-one others constitute a fairly consistent and well-standardized type (pl. 39, *a–h*) that was represented in practically all parts of our excavations. The shafts are thin, either tapered or parallel sided, 15 to 26 mm. long, and biconvex or lozenge shaped in cross section. Bases are wide, relatively thin, irregular in shape, and usually have been retouched only on edges immediately adjoining the well-made shafts. One bears the broken stump of a second drill shaft; another has a well-made graverlike corner at one side. In specimens that can be considered complete, overall length is 32 to 52 mm., flange width 16 to 36 mm., and shaft length as given above. I do not believe these objects were ever hafted; held between the fingers and used with care, they might have served for boring small holes in wood or shell, or for piercing leather. They are known from related sites in the area.

A single specimen can be classed as abrupt widening with small flange. It is T-shaped, 70 mm. long, with a shaft rhomboidal in cross section and a 21-mm. crutchlike base. The midportion of the shaft, in common with several others from basin 2, mound 17, is stained by resin or other carbonized matter (pl. 39, *l*; fig. 49, *d*).

In addition to the above groups, there are 5 drills that may be termed uncommon forms. One (pl. 39, *m*) has a slender slightly worn point 19 mm. long, widening abruptly into a 7-mm. thick flange with oppositely beveled edges and concave base; total length 60 mm. Another delicately made specimen (pl. 39, *i*) with tapered point, rectangular flange, and concave base, is 33 mm. long, 10 mm. wide, and 2.5 mm. thick. A third specimen, unfortunately incomplete, indicates that planoconvex end scrapers were occasionally provided at the smaller end with a drill point—a combination that I have seen occasionally in local collections from other central Kansas sites (see also, Udden, 1900, p. 46).

Our investigations indicate that the two drill types most representative of the Tobias site are the large heavy plain-shafted, occasionally stemmed objects for which the term "pipe-drill" may be suggested; and the abrupt widening, large-flanged form. Both these varieties were found in several pits, in the mounds, and in the basins. The exceptionally heavy concentration of "pipe-drills" in basin 2 (52 percent of all) is curious, but no ready explanation presents itself unless it be that the structure represented a workshop or community gathering place for the males or special artisans of the village.

*Knives with unbeveled edges.*—What must have been, to judge from the fragments found, a fairly common artifact type is very inadequately represented in our collections. There are about 20 mid- or end-section pieces of elliptical, ovate, or otherwise oblong-rounded forms, with the edges evenly thinned and sharpened by retouching from both faces. These fragments rarely exceed 7 to 10 mm. in thickness; and this, relative to their width and presumed length, probably made them fragile and easily broken. The exact shape and dimensions of the knives is, of course, conjectural, but I would suspect that they approached in these particulars the oblong round-ended specimen described by Udden (1900, p. 39 and fig. 15) as nearly 5 inches in length, 2 inches in width, not more than a quarter of an inch in thickness, with an even, sharp edge all around. That larger blades were also made is indicated by a complete specimen from basin 1, mound 17 (pl. 46), which measures 198 by 61 by 9 mm. The edges have been carefully thinned; at the narrow end they are blunted by grinding to a distance of 45 mm. from the tip (fig. 51, *b*). The material is a pink and gray-banded chert containing fusulinid fossils, and is probably from the Florence flint of southern Kansas. A somewhat smaller incomplete specimen of gray chert from basin 2, mound 17, has a broad rounded end from which the sides converge evenly to a fracture; it is 120+ by 55 by 9 mm. There is no evidence that any of the above specimens were hafted.

Three incomplete specimens designed for hafting may be noted here. One, from pit 3A, looks like a large spear point; it has an expanding stem with blunted edges and convex-edged blade with tip missing. The others, both from basin 2, mound 17, are end fragments of lanceolate or elliptical objects with lateral notches near the tip, whence the edges of the blade expand. They are 7 to 8 mm. thick, but their original length and width are not determinable. Except for the notches, they are indistinguishable from the knife fragments described above.

*Knives with beveled edges.*—This large and somewhat variable series includes elongate, usually pointed, forms in which two contiguous edges have been oppositely and abruptly beveled. They include notched and stemmed forms, as well as others not clearly provided with means for hafting. Their use is problematical, and the several forms discussed here have been variously identified as spear points, knives, scraping tools, and other objects, by different workers (pl. 40).

The most common form has a pair of broad shallow notches just above a flattened, rounded, or pointed base; from the notches, the edges of the blade taper rapidly at first and then more slowly to the tip, thus forming a markedly concave curvature. The blade is usually quite slender, approximating 10° to 12° segments of a circle; and the opposite beveling of the edges results in a rhomboidal cross section (pl. 40, *a–e*). Rare specimens are broader, with convex edges that attain their maximum breadth well above instead of just at the notches (fig. 50). Sometimes one notch is missing. All specimens, when held with the tip up, show the beveling on the *left* edge of the blade whereas that on the right edge is not visible. Complete specimens seldom exceed 100 mm. in length, but there is one broken piece of 130 mm. that may well have been several centimeters longer; width is from 25 to 40 mm., and thickness is usually under 8 mm. There are from the site 11 examples of this form, whole or with only the extremities missing, besides 6 basal fragments showing one or both notches. Udden (1900, p. 41 and pl. IV, 2, 4) reports similar objects from the Paint Creek site, suggesting that the slender-bladed specimens attained this form by repeated sharpening through retouching of the beveled edges. I have seen others from the Gray site (protohistoric Pawnee), near Schuyler, Nebr.

Less common are unnotched, narrow-bladed objects with bases that are simple rounded, tapered truncated, or parallel sided with tapered extremity. There are four of these, of which only one is complete (pl. 40, *f*, *i;* figs. 51, *a*, and 53, *b*).

Finally, there are four other unnotched knives with wider beveled blades and a short tapered base that may or may not have beveled edges. The general outline is lozenge shaped to lanceolate; one or two suggest, but are not quite identical with, the so-called Harahey knife (pl. 40, *j*). All are made of brown jasper; they are 80 to 127 mm. long by 27 to 38 mm. wide. There is no evidence that these implements were hafted (fig. 51, *c*).

Thirty-four other fragments, broken from the blades of specimens of one of the foregoing types, cannot be classified other than as beveled-edge artifacts. They range from very slender drill-like pieces to broad blades, with rhomboidal or lozenge-shaped cross section.

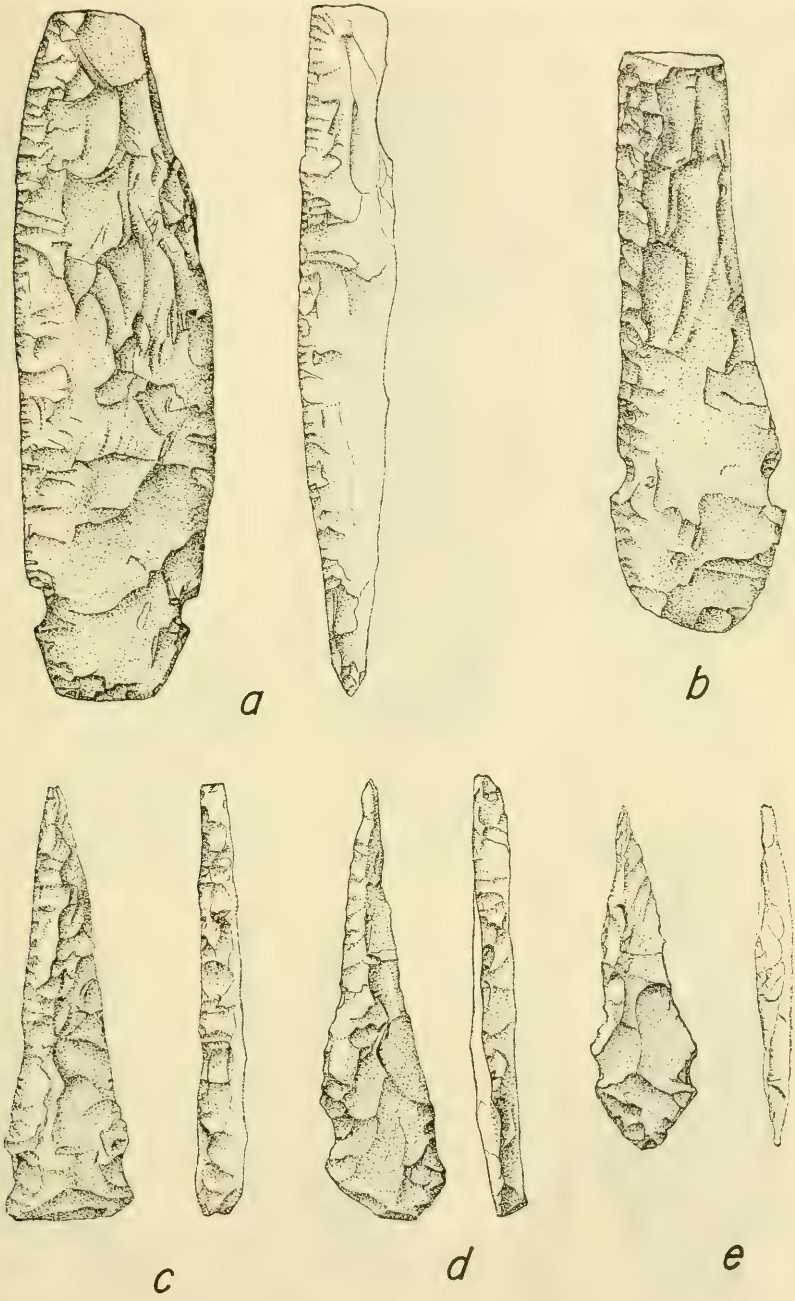

FIGURE 50.—Chipped knives with two beveled edges and side notches, from Tobias site. Length of *a*, 15.5 cm.

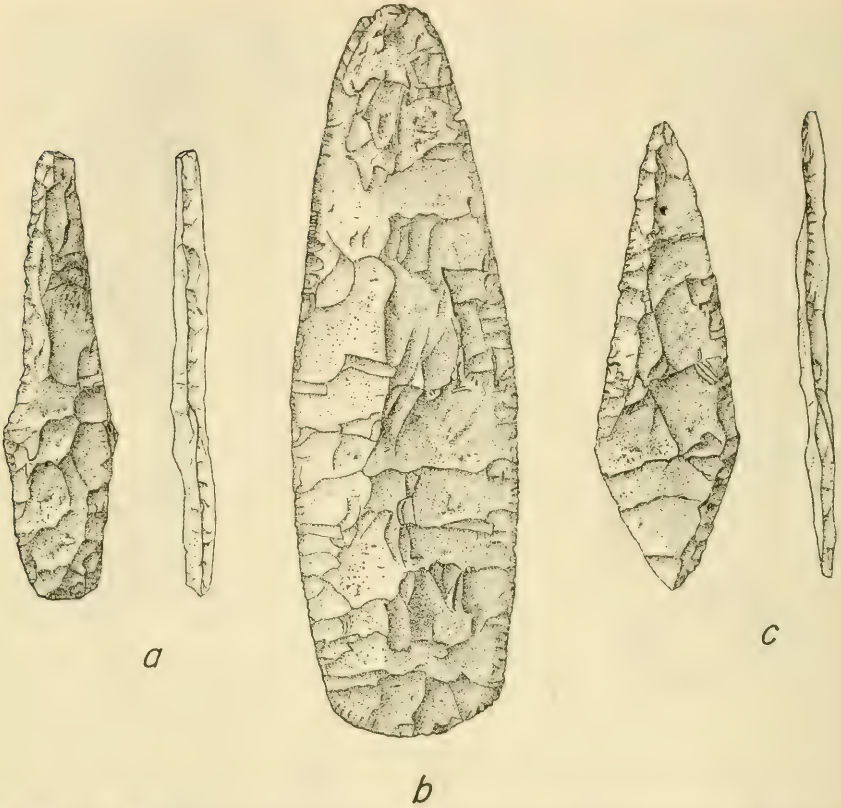

FIGURE 51.—Knives with unbeveled (*b*) and beveled (*a*, *c*) edges, Tobias site. Length of *b*, 19.8 cm.

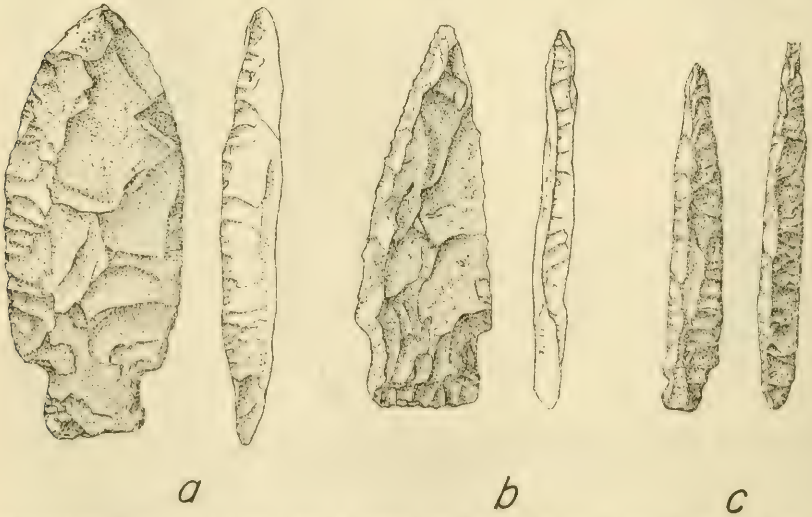

FIGURE 52.—Stemmed knives with beveled edges, Tobias site. Length of *a*, 9.5 cm.

Five are of brown jasper, the others of whitish, gray, or pink-banded chert.

There is, of course, no sharp line between beveled and unbeveled knives, though the bulk of the beveled pieces are rather distinctive in shape as well as in the treatment of blade edges. From basin 2, mound 17, however, came a fire-fractured blade with one end and part of one side missing, and with smoothed lateral notches near the narrow end. Present length is 155 mm., thickness about 10 mm., and width, if a measure of symmetry can be assumed, must have been about 55 mm. The shape and dimensions approximate those of the larger unbeveled pieces.

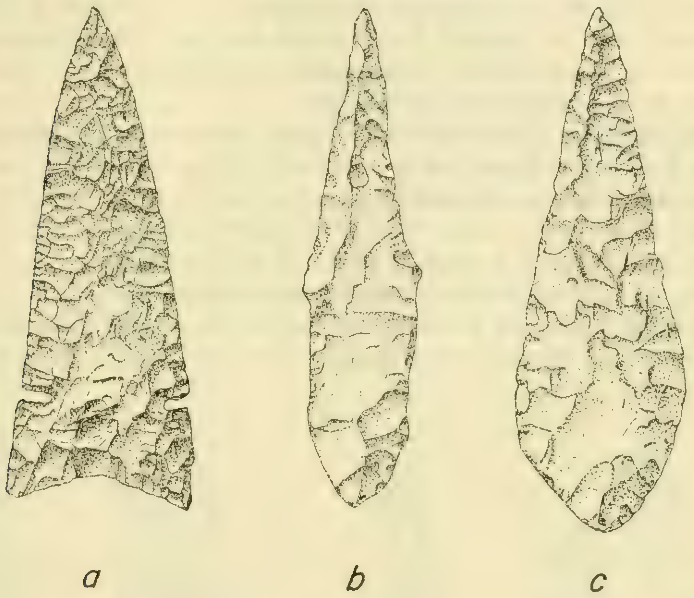

FIGURE 53.—Chipped point and beveled knives, Tobias site. Length of *c*, 10 cm.

*End scrapers.*—Upward of 250 of these ubiquitous little objects were found; they came to light wherever we dug on the site. They are like those from hundreds of other sites in the Plains region: planoconvex in cross section, prominently ridged dorsally or less commonly (ca. 8 percent) low and flattened, varying in outline from subtriangular to subelliptical or subovate, and with the edges retouched all around (pl. 41). The plane underside, representing the unmodified cleavage surface, is usually curved or "twisted" somewhat. Maximum thickness is near the wide end, which is always steeply sloped. Very commonly the edges are blunted. In size, they range from 17 to 97 mm. long, 14 to 40 mm. wide, and 5 to 15 mm. thick. In the longer specimens, width-length ratio is about 1:2.5, whereas in the shorter examples it is about 3:4. Small scrapers predominate. Of 259 specimens, 98 (38 percent) are under 30 mm. long, and 192 (74+ percent) are under 38 mm. This compares favorably with the coeval Leary site (Oneota) where 346 of 437 scrapers, or 79+ percent, were under 38 mm. long. By contrast, the "El Quartelejo" site (Dismal River) in Scott County yielded 239 end scrapers, of which only 79 (33 percent) lie within this size range. Comparable series from other sites and horizons are either not available or still await publication, so comparisons with Lower Loup sites, for example, cannot be made. In earlier horizons, as the Upper Republican, I have the impression that larger specimens are the rule. Just what significance, if any, these variations in size may have in terms of function I cannot say, but should future work bear out the suggested size decrease in protohistoric times, some explanation other than mere chance would seem to be called for.

*Side scrapers.*—This is an exceedingly varied series of implements which I have not attempted to subdivide. They are made from thin, sharp-edged flakes and spalls of all sizes and shapes, converted into cutting or scraping tools through fine retouching of one or more edges. Retouching is usually confined to the extreme edge, which in some of the heavier specimens has been chipped back into a steeply pitched flat-bottomed working surface; it is always limited to the convex surface of the flake (fig. 54). The wide variety in form, size,

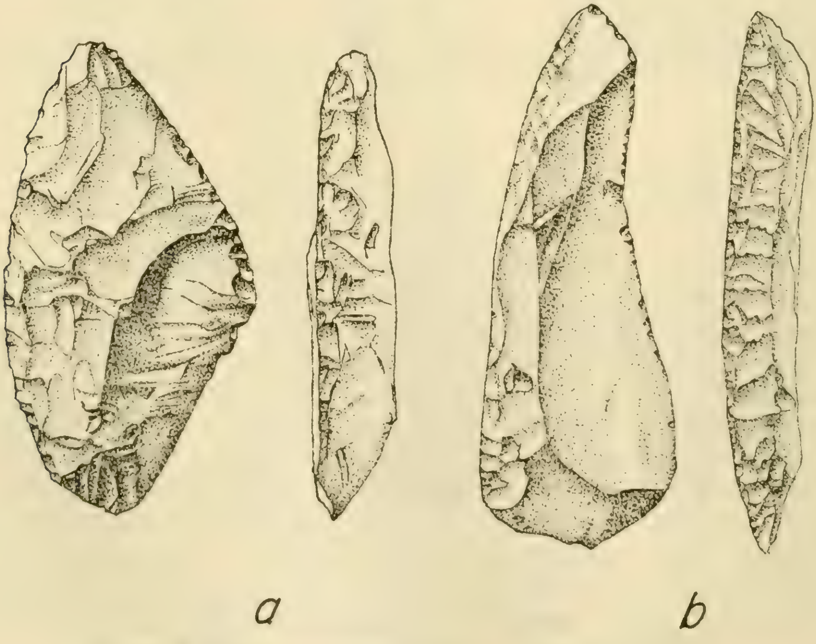

Figure 54.—Side scrapers from Tobias site. Length of *b*, 10.8 cm.

and material suggests that the flakes were byproducts or improvisations rather than intentionally struck blanks. A high proportion of the side scrapers is of banded foraminiferal Florence flint, though practically all other chippable stone used on the site is also represented.

Side scrapers vary from small thin slightly curved lanceolate or elliptical pieces 30 or 40 mm. long by 15 or 20 mm. wide with all around retouching (flake knives?) to long subelliptical, subovate, or irregular spalls 120 to 140 mm. by 25 to 60 mm., with only one straight or curved edge retouched. Single-edge retouching is most common, but a number show two or more distinct working edges. Some are low and flat in cross section, others have a prominent ridge along the midline or at one side. Most extensively modified are a few narrow curved and keeled forms somewhat resembling the end scrapers, but with the long edges only retouched or worn. There is no evidence of hafting, and most or all were probably held directly in the hand. Approximately 250 specimens are classed as side scrapers; they were at least as plentiful as end scrapers, and it is possible that because of their less regular shape and limited retouching others were overlooked in the general digging.

*Axes.*—These are large, thick, coarsely chipped ovate to subelliptical objects, with two broad notches that have been worn or battered smooth. The blades are generally sharp, but sometimes show finely chipped or crumbled edges that suggest heavy or long use. They were shaped solely by percussion flaking, I think, and show none of the fine pressure retouching of the projectile points, knives, and scrapers. Length is from 85 to 156 mm., width from 63 to 97 mm., and thickness from 20 to 36 mm. There are only 8 examples, most of them from various parts of the mound 17 complex. It appears thus that hafted chopping tools were much less important in native technology than were crushing implements of the hammer type.

*Cache flints.*—Elsewhere the finding of a cache of flints in basin 1, mound 17, has been noted (p. 221). The great majority were flakes and spalls, of irregular shapes and sizes, from 20 to 100 mm. in greatest dimension. With exception of perhaps a dozen specimens, none show secondary chipping. The material includes some brown jasper and pink foraminiferal Florence flint, but 95 percent or more is a blue-gray, often lightly mottled, stone whose exact source is undetermined. The pieces are of sizes suitable for manufacture of projectile points, scrapers, knives, and other objects and undoubtedly represent the raw materials store of some long-dead flintworker.

Besides the unworked flakes, the deposit yielded six side scrapers, five low-backed end scrapers, two small bits of beveled implements, and a large ovate notched ax blade. All were of the same blue-gray chert as the flakes.

### OBJECTS OF GROUND AND PECKED STONE

Our collections indicate that there was a rather extensive utilization of various artifact types made by hammer pecking and/or grinding techniques. Unfortunately, it has not been possible to submit the artifacts for examination by geologists familiar with the immediate region, but it is evident that both local and nonlocal materials were employed. As indicated elsewhere, there are ledges of Dakota sandstone immediately north and east of the site, and this material was thus easily available in unlimited quantities. Whether, or to what extent, quartzite boulders occur in the Rice County area I am not prepared to say, but the presence of Sioux quartzite probably indicates contact with the lower Kansas River valley below Manhattan. Limestone was not extensively used; it may have been obtained from southeastern Rice County or elsewhere from Permian outcrops to the east or southeast a few miles distant from the site. It is clear, at any rate, that the toolmakers of the Tobias site were not restricted in their use of raw stone to the materials available only at their doorsteps. (See table 6.)

*Grooved mauls.*—There are 19 examples of these objects from the Tobias site, if we include two or three spalls too fragmentary to be further classified as to shape. Thirteen are made of quartzite; about half of these are of pinkish or purplish-red stone which I suppose is Sioux quartzite from glacial deposits in northeastern Kansas. Granite, sandstone, and limestone are each represented by two specimens. There is considerable variation in size, shape, weight, and quality of workmanship, and the specific uses to which they were put, other than the general one of pounding, evidently varied. In the following discussion, I have divided them on the basis of form rather than according to assumed use.

Group I includes three exceptionally well-made specimens of Sioux quartzite, all from the mound 17 complex: one came from each of the basins, 1 and 2, and the third from basin 2, pit E (pl. 42, *a*, *b*). All are cylindrical or very nearly so, the sides meeting the circular, flattened striking surfaces in a well-defined rounded angle. A groove about 5 mm. deep by 12 to 15 mm. wide encircles the middle; it is usually unmodified, but in one instance is formed by two low parallel ridges or flanges rising from the body of the maul. The striking surfaces, already described as flattened, actually vary from slightly convex to very slightly concave; and the surfaces generally are finely "dimpled" from the shaping process. They range in length from 95 to 100 mm., in maximum diameter from 89 to 97 mm., and in weight from 44 to 58 ounces. None shows evidence of heavy use, and the striking surfaces are undamaged. If intended as utility tools, they cannot have been used long or roughly; and since similar

TABLE 6.—*Ground stone objects from Tobias site, 14RC8*

| | Pits | | | | | | | | | | | Mound 4 | Mound 6 | Mound 17 | | Trench |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1A | 1B | 2 | 3 | 3A | 4 | 5 | 6 | 8 | 8A | | | Basin 1 | Basin 2 | |
| Mauls, grooved: | | | | | | | | | | | | | | | | |
| I | | | | | | | | | | | | | | 1 | 2 | |
| II | | | | | | | | | | | | | | | 1 | |
| III | | | | | | | | | | | | 1 | | | 3 | |
| IV | | | | | | | | | | | | | | | 1 | |
| V | | | | | | 1 | | | | | | | | 1 | 4 | 1 |
| Hammerstones | | | | | | | | | | | | | | | | |
| Mealing stones | | | | | 1 | | | 1 | | | | | | | 1 | |
| Mullers | 2 | | | | 1 | | | 1 | | 2 | | | | 2 | 4 | |
| Mortars (?) | | | | | 1 | | | | | | | | | | 2 | |
| Discoidal rubbing stones | | | 1 | | | | | | | | | | | | | |
| "Sinew-stones" | | | | | 2 | | | | | | | | | | | |
| Shaft smoothers | 5+ | 3+ | 2+ | | 5+ | | 3+ | 4+ | 2+ | 4+ | 3+ | 1 | 14 | 8+ | 12+ | |
| Sharpening stones | | | | | | | | | | | | | 1 | | | |
| Shaft polishers (?) | | | | | | 1 | | | 1 | | 1 | | | | | |
| Stone pipes: | | | | | | | | | | | | | | | | |
| L-shaped | | | | 1 | | | | | | | | | | | 1 | |
| Projecting stem | | | | | | | | | | | | | | | 2 | |
| Tubular | | | | | | | 1 | | | | | | | | 1 | |
| Pipe fragments | 2 | 1 | 2 | | | | | | | 2 | | 1 | 1 | 5 | 2 | |
| Catlinite (other than pipes) | | | | | | | | | | | | 1 | 1 | | | |
| Turquoise beads | | | | | | | | | | | | | | 33 | | |
| Disks, sandstone, perforated | 3 | | | | 1 | | | | | | | | | 1 | | |
| Disks, sandstone, imperforate | | | 1 | | | 1 | | | | | 2 | | | | | |

well-made symmetrical and undamaged specimens have been found at other nearby sites (pp. 276, 337; also Brower, 1899, pl. 11; and Udden, 1900, pl. 5), it is possible that they were nonutilitarian.

Group II is represented by a single specimen of vesicular gray quartzite, found in mound 17, basin 2. It is subcylindrical; the polls are rounded, and a groove encircles the middle. It is 98 mm. long, 86 mm. in diameter, and weighs 32 ounces. In general appearance and size it approaches specimens in the preceding group, but was made with much less care and little regard for symmetry or appearance. Its irregular conformation, even with due allowance for damage sustained in use, results basically from utilization of a boulder which was only partly dressed between striking surfaces, and so still retains here and there sizable areas of the original boulder face. The type is shown in plate 42, *c*, *e*.

Group III includes four complete specimens, three of them from mound 17, basin 2, and the fourth from mound 6. Two are of quartzite, one of sandstone, and the mound 6 specimen is of granite. They differ markedly from the preceding groups in being somewhat compressed laterally with an ovoid or broadly elliptical outline. The polls are more strongly rounded, usually diminishing in diameter from the margins of the groove so that the side walls are very short or even indistinguishable. One specimen has the poll margins somewhat battered, but in general there is little or no evidence of breakage from use. Two have strongly dimpled surfaces, showing that they were hammer pecked into their final shape. Measurements are: length, 83 to 173 mm.; width, 90 to 138 mm.; thickness, 65 to 102 mm. Weight ranges from 28 to 106 ounces (pl. 42, *d*, *g*).

Two spalls, one of granite from mound 17, basin 2, the other of quartzite from pit 5, each show traces of a groove and a small section of rounded poll. They probably are pieces broken from mauls of the same type.

Group IV includes one small specimen of fine-grained red quartzite from mound 17, basin 2. In general it may be characterized as tapered; one poll is circular and flattened, with distinct side walls, whereas the other is short and rounded, with no trace of straight walls. It was fashioned apparently from an asymmetrical boulder, whose form may have partially dictated the shape of the finished artifact; the groove is shallow and indistinct on about half the specimen because of a flaw in the stone. In contrast to the preceding groups, where the groove encircles the specimens at the middle, the present example has the groove nearer the smaller rounded end.[22] It is possible that this end was completely covered by a rawhide binding and the flat poll used for pounding pemmican or in some similar activity. The piece is 79 mm. long, has a maximum diameter of 89 mm., and weighs 27 ounces (pl. 42, *f*).

---

[22] Resembling in this respect and in its longitudinal asymmetry numerous northern Plains mauls, large and small, in the Division of Ethnology, U. S. National Museum.

In addition to the foregoing varieties, there are eight specimens so badly battered or split as to resist classification. One or two vaguely suggest group II, but with large fragments split away from one or both polls; in two cases, this spalling has almost completely destroyed one poll. Most of the specimens seem to have been somewhat flattened and irregular, originally perhaps like group III. In any case, whether they served in stoneworking, chert quarrying, stake driving, crushing of heavy bones, or for other purposes, it is clear that they have been subjected to much rougher or more prolonged duty than any of the classified specimens described above. Five are of quartzite, two of limestone, and one of sandstone. Considering their present fragmentary state, measurements and weights give a rather inaccurate picture, though they do afford some indication of their proportions relative to the complete specimens. In the less fragmentary examples, length varies from 116 to 145 mm., maximum diameter from 77 to 117 mm., and weight from 32 to 59 ounces. One specimen comes from pit 3A; the others are from various parts of the mound 17 complex.

To judge from recent ethnological examples, these implements were mounted on wooden handles 14 to 24 inches long, which were bent around the stone at the groove and held together with a rawhide covering. This covering, applied when green, commonly encased the middle or one-half of the head. It shrank on drying and thus secured the head.

Grooved mauls in a variety of shapes and sizes, and doubtless intended for diverse purposes, were widely used throughout the Plains area in historic and protohistoric times. So far as I know there has been no detailed analytical or distributional study of them; none will be attempted here. Crude fragmentary specimens from Signal Butte I (Strong, 1935, p. 230 and pl. 25, fig. 2, *o*), if correctly identified, would suggest a measure of antiquity. Curiously enough, they are exceedingly rare, if not indeed absent, from such subsequent prehistoric Central Plains horizons as the Woodland, Upper Republican, and Nebraska Culture, although at Pecos, where they are not common, Kidder (1932, p. 55) reports them in pre-Glaze II and apparently also Black-on-white associations. I have been unable to find any published record of the well-shaped cylindrical form (group I, supra) outside of central Kansas, possibly excepting two fine specimens from the Hill and Palmer sites, both Pawnee, in Nebraska (Wedel, 1936, p. 77). Less carefully made mauls, often little more than a suitably shaped or slightly worked boulder provided with a groove, occur archeologically from Texas (Sayles, 1935, pl. 15 and Map E; Studer, 1934, p. 91 (?)) through Kansas (Martin, 1909, pl. 9, fig. 79; Brower, 1899, pl. 11; Udden, 1900, pl. 5; Jones, 1929, p. 98) and Nebraska (Dunlevy, 1936, p. 196; Hill and Metcalf, 1942, p. 193) to the Dakotas (Strong, 1940, p. 375; Will and Hecker, 1944, p. 25), and Montana (Mulloy, 1942, p. 57). As surface finds, there are innumerable specimens throughout the Plains from Texas to the Saskatchewan River. This brief and no doubt incomplete recital of records does not pretend to delimit the area of occurrence, but it partially suggests its extent, and it is worth noting that most of the specific site records seem to apply to the protohistoric and historic periods. Also, they discredit the somewhat ambiguously phrased and possibly misread suggestion by Over (1940, p. 336) that "South Dakota appears to be about the center of the area in which they [i. e., grooved mauls] are found . . .," and further, that ". . . Those found outside of the above area [i. e., south of Nebraska] were probably exchange pieces traded with neighboring tribes. . . ." I see no reason to doubt that most or all of the Tobias site specimens, above described, were made locally.

*Hammerstones.*—There are but six examples of these in our collections, though from the abundance of pecked and ground objects at the site I would suppose that hammerstones must have been present in much larger numbers. Four are of chert, and two of quartzite. Those of chert, were originally somewhat flattish and subcircular, the others irregularly oblong. All have battered ridges, angles, and peripheries, and have evidently seen much use against hard substances. One quartzite specimen has shallow smoothed pits suggesting finger holds. They vary in maximum dimension between 50 and 82 mm., with both quartzite specimens exceeding in size and bulk those of chert. Coming from mounds, pits, and basins, they do not differ significantly from the hammerstones to be found in and on camp and village sites of all periods in the Plains.

*Mealing stones and manos.*—That the inhabitants of the site were accustomed to grinding their corn on stone mills is attested by the presence of a number of these specimens. The nether element, for which I deliberately choose the term mealing stone in preference to metate, is usually of hard dense Dakota sandstone; the smaller upper or handstone is of sandstone, quartzite, or rarely limestone. In details of form and in the inferred method of use there appear to have been some variations.

The largest specimen in our series (USNM 388716; see pl. 43, *g*) has been carefully worked into an elliptical shape, with the upper surface and edges smoothed so that no pecking scars remain. The upper surface has an elliptical depression 35 cm. long by 20 cm. wide by 1.2 cm. deep, inferentially from the use of a small handstone with a rotary grinding motion. The slab itself measures 65 by 43 by 9.5 cm., and was taken from pit 5. A smaller, thicker, and less carefully finished mealing stone, also with elliptical grinding cavity, was found in pit 3.

A third stone (USNM 389013; see pl. 43, *f*) was evidently used in different fashion, to judge from the contours of the grinding surface. This is a rectangular sandstone block, with one end more or less squared and the other rounded. The edges have been somewhat undercut in the shaping process but, like the irregularly flattish underside, have not been smoothed. The grinding surface is concave lengthwise and flat transversely, thus indicating beyond cavil a back-and-forth grinding motion with a long flat-bottomed mano. The grinding surface is generally well smoothed from use, but has numerous shallow pits—perhaps from "roughing" to improve a surface too smooth for effective grinding (cf. Kidder, 1932, p. 69). The stone measures 40 by 29 by 8 cm.; it was found in mound 17, basin 2, pit E, from which came also the largest mano we obtained.

Manos are represented by seven complete and five fragmentary specimens. The former are generally symmetrical and well shaped; with one exception, they have but a single grinding surface. The largest examples, of which there are three, are elongate–elliptical with narrowed rounding ends and planoconvex cross section (pl. 43, *b*, *c*); they range in length from 19.2 to 23.9 cm., in width from 8.2 to 9.8 cm., and in thickness from 4.5 to 5.7 cm. Another group includes three shorter specimens that are subrectangular with rounded corners, and subquadrilateral or bun shaped in transverse cross section (pl. 43, *d*); they are 12.5 to 15.2 cm. long, 8 to 9.2 cm. wide, and 2.6 to 5.3 cm. thick, the thinnest specimen being bifaced. The seventh whole specimen is irregular in shape, but lies nearer the second group in size. Four of the fragments are ends, and they seem to be equally divided between the two forms found among the complete specimens.

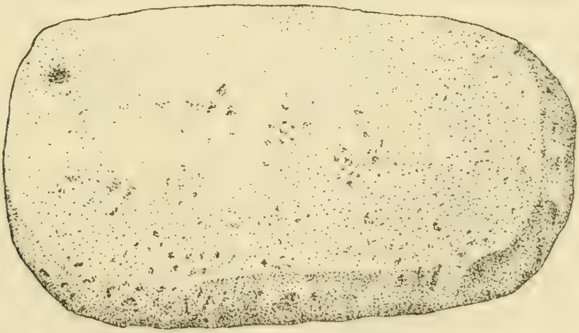

FIGURE 55.—Mano from Tobias site. Length 12.5 cm.

Eight of the manos are from various parts of the mound 17 complex, the others from pits 1, 3, and 5. The whole specimens, it should be noted, are flat or very nearly so on the grinding face, and therefore must have been used with a nether stone whose surface was transversely flattened; neither their shape nor size would work on either of the elliptically concave stones described above. For use with the latter, I would suspect a yet smaller circular or bun-shaped muller, whose diameter would be somewhat less than that of the grinding cavities, but of these, there is no certain evidence in our collections (cf. pl. 43, *e*).

Large sandstone mealing slabs and manos have been reported from several other nearby sites in central Kansas (Udden, 1900, p. 50; Brower, 1899, pl. 9; Jones, 1929, p. 98), and it is clear that they were much used in the protohistoric period. Other finds suggest that they were known also in late precontact sites (Brower, 1899, pl. 9 top; Wedel, 1935, p. 229), though north of the State they become much scarcer.

*Mortars* (?).—These are oblong, squarish, or round blocks of sandstone or limestone that have been hammer dressed to shape but were not smoothed. They are smaller and proportionately thicker than the mealing stones, ranging from 17 to about 30 cm. in maximum diameter, and from 7.5 to about 12 cm. in thickness. Each has on one surface a shallow circular concavity 12 to 14 cm. across by about 1 cm. deep; one has a second cavity, slightly smaller and shallower, on the opposite face. These depressions, evidently pecked out with a hammerstone, are evenly contoured but have not been rubbed smooth; and I see no reason for supposing that any of them were intended to receive a manolike or mullerlike handstone. It is possible that they were anvils, set on rawhide, and used in pulverizing meat, berries, and other food with a stone hammer. Two of our specimens (pl. 43, *a*, *h*) are from mound 17, basin 2; the third is from pit 3.

*Discoidal rubbing stone.*—This is a circular or bun-shaped quartzite object, with one surface slightly convex and worn, the other markedly convex and dressed but not worn. Measuring 10 by 4.8 cm., it fits the hand nicely when held with the worn side down. It is possible that this sort of handstone was used with the mealing slabs which have an elliptically hollowed surface, or it may have been for rubbing hides. The specimen is from pit B.

"*Sinew-stones.*"—This term is applied to two specimens from pit 3, but it rests on no documentary or other direct evidence and may be incorrect. Both are of quartzite. One is circular in cross section with one side flattened and the other thickly convex; it measures 6 by 9 cm. On the convex surface is a shallow pit, on either side of which a shallow groove runs part way down the sides of the stone to match, but not quite meet, shallow notches worn into opposite edges of the flattened surface. Suggestions of additional notches occur elsewhere around the edge of this face, all showing rather more evidence of wear than those on the pitted surface. The second specimen is somewhat rectanguloid in outline with elliptical cross section and suggests a small muller, but has not been so used. On the upper outer surface is a well-worn notch 7 to 8 mm. in maximum depth by 30 or 35 mm. wide. In both specimens the notches or grooves tend to be broadly V-shaped and seem to have been produced by the action of a cord, thong, or other soft substance drawn repeatedly through them. They differ markedly from the shaft-smoothers and polishers found on the site, and must have had a different use.

*Shaft smoothers.*—This widespread Plains artifact type was abundantly represented everywhere in our excavations, there being 11 complete specimens and 90 or more fragments. All are of yellowish to reddish-brown Dakota sandstone with excellent abrasive qualities. There is, of course, much variability in size and shape, but in general they appear to have been somewhat wider than thick, with the ends squared or rounded, a flat, well-finished, longitudinally grooved surface, and the sides and bottom somewhat rounded (pl. 44, *g*). The groove varies from a thin straight incision, suggesting a guide line, to a deep U-shaped channel, the deeper examples all being of a size to accommodate easily an ordinary round lead pencil (diameter ¼ inch). The complete specimens are from 40 to 120 mm. long, 20 to 40 mm. wide, and 13 to 26 mm. thick. An occasional fragment has a second groove on the flattened underside, or else fine deep grooves on one or both of the narrow lateral surfaces.

These objects undoubtedly were for the purpose of shaping and smoothing wooden arrowshafts. They were used in pairs, with the flattened and grooved surfaces held together and the stick rotated between them. La Flesche (1924, p. 113) describes the process among the Omaha as follows:

> . . . A good arrowmaker aims to make the shaft as nearly cylindrical as possible. To accomplish this, he holds the shaft in his left hand between the sandstone polishers, each piece grooved lengthwise, and gives the stick a twirling motion by rolling one end of it back and forth on his thigh with the palm of his right hand. He shifts the polishers along the shaft in order to keep it uniform in size. When one end is polished, he works in the same manner on the other end, until the full length of the shaft is round, smooth and uniform.

All of our finds at the Tobias site were of single specimens, but from the nearby Malone site (p. 338) came a shaped sandstone block grooved for splitting that shows both the method of manufacture and the fact of pairing (USNM 389314; pl. 44, *i*). Matched sets and shaped but unsplit blocks, as well as numerous single examples, have been found in Pawnee and Oneota sites in Nebraska (Wedel, 1936, p. 80;

Hill and Wedel, 1936, p. 45), and the type has a very wide archeological distribution in and about the Plains. Apparently, it extends back in time at least as far as Signal Butte I (Strong, 1935, p. 230); and it is common in practically all known subsequent horizons except the Woodland.

*Shaft polishers* (?).—Here are included three whole and broken limestone blocks, each of which has one grooved surface. One, from mound 17, basin 2 (pl. 42, *i*), is of gray crystalline calcite, irregular in outline with two flat smoothed surfaces parallel to one another. Across the larger surface is a straight shallow groove 55 mm. long by 9 mm. wide by 3 mm. deep. The specimen itself measures 71 by 59 by 49 mm. Another is the half of a broken circular block 78 mm. in diameter by 47 mm. thick. The sides and bottom are roughly dressed to shape, and the top has been smoothed. A groove 13 mm. wide by 4 mm. deep has been cut across the upper surface, then hollowed slightly and polished smooth by a rodlike object, except for a narrow shelf along each side where the cutting scars remain. On one side the groove is bordered by a narrow ridge, beyond which the surface of the stone has been scraped away to the approximate depth of the original *cut* groove. This specimen (fig. 56, *a*) is from pit 3A. The third, from pit 6, is the planoconvex upper half of a horizontally split oblong cobble. The flat underside has been dressed to an even surface but not smoothed; the upper convex surface is smoothed, and is traversed by a narrow, shallow groove showing unmistakable, but not marked, evidence of rubbing.

These fine-grained grooved implements are something quite different from the coarse-grained shaft smoothers previously described

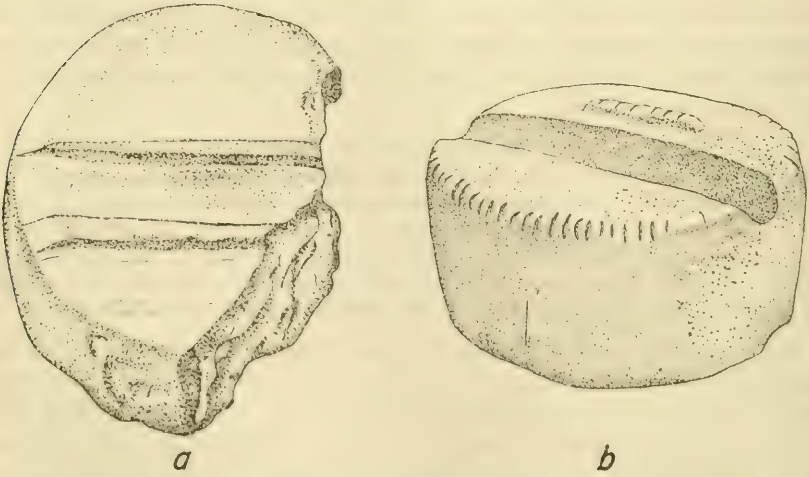

Figure 56.—Ridged and grooved shaft polishers from Tobias (*a*) and Paint Creek (*b*) sites. (*b*, Courtesy of J. H. Fries, McPherson, Kans.)

as used in pairs; and they have a vague resemblance to the arrowshaft straighteners of the Southwest (Kidder, 1932, p. 76). Whether they were used in the same way as the latter, I am unable to say. That specimens of Southwestern origin were not unknown to the Great Bend peoples is suggested by a fine piece (pl. 42, *h*) that came to my attention in 1953 through Mr. J. H. Fries of McPherson, Kans. This is a round flat block of dark-green steatite, 75 to 85 mm. in diameter and about half as thick. The groove is 15 mm. wide by 9 mm. deep; and 67 notches have been cut into the periphery of the block on its grooved surface. A ridge 30 mm. long parallels the middle of the groove at a little distance, and this ridge also has 6 notches (fig. 56, *b*).

According to Mr. Fries (letters of February 6 and 16, 1953), this object was picked up on the Paint Creek site, McPherson County, "near the center of the council-circle," which has gone under the plow since I first saw it. It recalls to mind some of the shaft straighteners reported from Pecos (Kidder, 1932, pp. 76–80). Only six round-bodied specimens are there reported; and ". . . all the ridged ones which could with certainty be dated were taken from Glaze V and later rubbish." The Paint Creek piece does not exactly match any of the round blocks figured by Kidder, but it conforms in all particulars to the type represented at Pecos. It is an alien piece in the Plains and was probably carried into central Kansas from the Pueblo area.

*Sharpening stones* (*hones*).—Several irregular sandstone fragments, some of which may be greatly altered bits of shaft smoothers, have evidently been used for sharpening awls, needles, or other similar slender-pointed objects of bone or wood. They bear grooves which, unlike those of the shaft smoothers, are not straight or of uniform width and depth; and, as often as not, the grooves end abruptly short of the end of the stone. Sometimes the grooves converge or criss cross, and they are generally short, narrow, and deep. These could not possibly have served in the shaping or smoothing of rodlike objects, but they could and probably did serve efficiently for sharpening pointed implements (pl. 44, *j*, *k*, and fig. 57).

*Stone pipes.*—Six complete pipes, representing at least three distinct varieties, were found, besides which there are perhaps 15 fragments probably or possibly from additional specimens. Of the whole pipes, four are from mound 17, basin 2; pits 3 and 4 each yielded one. The usual material was catlinite or a fine-grained red to purple-red sandstone; there is one of steatite. It is presumed that all were provided with wooden, bone, or reed stems when in use, but of these no trace was found.

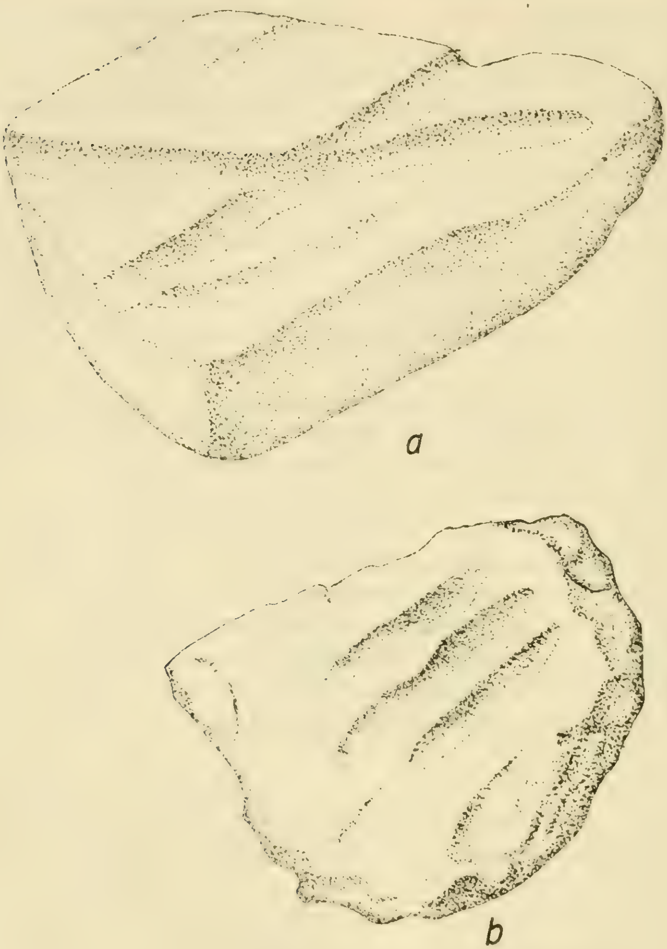

FIGURE 57.—Sandstone sharpening blocks from Tobias site.

The prevalent form of pipe was L-shaped, with the bowl exceeding the stem arm in length (pl. 45, *a–c*). The under side of the stem arm and the side of the bowl away from the smoker are characteristically straight, or nearly so, and meet at a right angle. The side of the bowl toward the smoker, on the other hand, is rather markedly convex or bulbous, and meets the upper side of the stem arm at an acute angle. Stem and bowl alike are conically bored, probably with flint drills; and the walls, from 1 to 3 mm. thick, are usually well smoothed. Decoration, to judge from our specimens and a number of others seen in local collections, is comparatively rare and simple; when present, it consists of a slight swelling near the top of the bowl, or of a narrow incised line or lines, or of narrow single or double beading about the outer lip of the bowl. Dimensions and proportions vary, of course, and our two specimens, though typical in form, do not show the full size range. In the pipe from pit 3 the bowl is 58 mm. long, with a maximum diameter of 15 mm., and a maximum bore diameter of 10 mm.; the stem arm is 21 mm. long and 14 mm. in greatest diameter. The second specimen, from mound 17, basin 2, has a smoke-blackened bowl 37 mm. high by 16 mm. in diameter, and a stem 22 mm. long by 14 mm. in diameter. The largest example of the type I have yet seen (pl. 45, *a*) is said to have been found on the surface a few hundred yards southwest of the site, and is now in the private collection of Lowell Peverley of Geneseo. Made of fine-grained dark-red sandstone, it has a bowl 83 mm. long by 19 mm. in diameter, and a tapering stem arm 36 mm. long.

In addition to the two whole specimens, we have at least 6 fragments that are almost certainly from elbow pipes in which the stem and bowl arms met at approximately a 90° angle. Neither arm is sufficiently represented, however, to warrant the unqualified assertion that they are of the foregoing type, though they may well be.

Two whole pipes, both from mound 17, basin 2, are characterized by bulbous bowls set approximately at right angle on stems that project beyond the bowl (pl. 45, *d*, *e*); both are of catlinite. In the larger specimen, the stem is 85 mm. long and tapers to a horizontally flattened "prow"; there is a laterally perforated crest 13 mm. long on the upper side above the stem opening, perhaps for attachment by a cord to the erstwhile wooden stem or to a sacred bundle. The blackened and "caked" bowl is somewhat compressed laterally, with a height of 25 mm. and a maximum diameter of 26 mm. The piece is well smoothed and polished. The second specimen is much smaller, but is also well finished and polished from use. The stem is 33 mm. long, with a deep encircling groove through which, on the upper side, a small hole has been bored into the stem cavity. There is some evidence that the stem was once longer. The bowl is 20 mm. in diameter.

The remaining two whole pipes are tubular in form (pl. 45, *h*, *i*). The larger specimen, from pit 4, is of catlinite; it is 77 mm. long and has a maximum diameter of 25 mm., whence it diminishes in a gentle curve to 21 mm. at the bowl end and to 14 mm. at the bit end. The bore tapers evenly from 15 mm. in diameter at the bowl end to 12 mm. at the stem end. Grinding striations are still visible, and there is no decoration.[23] The second example, from mound 17, basin 2, is of steatite. It tapers very slightly from a circular bowl end 20 mm. in diameter to a diamond-shaped stem 20 mm. wide by 15 mm. thick; total length is 70 mm. The bore is straight-sided, diminishing from 15 to 12 mm. in diameter; at the bowl end there are deep unevenly spaced lengthwise scorings suggesting that the maker was trying to enlarge the cavity. The method of boring and the implement used are not indicated. The exterior of the pipe is well polished, though some longitudinal striae are still visible.

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[23] A similar pipe in the Lowell Peverley collection is said to have been found about one-half mile northwest of the Tobias site, dissociated from any other evidences of aboriginal activity. It is of dark purplish-red sandstone; measures 92 by 21 mm.; and has a low beading at the bowl end with 3 parallel encircling incisions. About 25 mm. from the stem end, the drill broke out through the side of the pipe. The specimen is illustrated in plate 45, *g*.

Nine fragments of catlinite and sandstone appear to have been broken either from the bowls of L-shaped pipes or from the sides of swollen tubular specimens. They vary in length from 20 to 50 mm.; all are transversely curved and in four cases the longitudinal concavity is blackened or "caked" with carbon. One piece from pit 1 includes a short segment of the lip; it has 7 short nicks spaced at 1-mm. intervals on the lip exterior, below which are vestiges of two encircling incisions. Another piece from pit 1A shows a slight offset 9 mm. below the lip, reminiscent of that on our larger L-shaped specimen. Two fragments show some evidence of grinding or rubbing along the fracture edges, as if for reworking and secondary utilization.

There is, unfortunately, no detailed distributional study of pipe types in the Plains area, despite the fact that a wealth of comparative archeological material exists in various museums and private collections. Catlinite is exceedingly rare in prehistoric horizons of the Central Plains. Archeologically, stone tubes appear to have been uncommon in the area, though there are records of specimens, including one of steatite or similar material, from Upper Republican (Wedel, 1935, p. 200) and Dismal River (Hill and Metcalf, 1942, p. 187) sites in southwestern Nebraska. Elbow pipes of various forms, including bulbous-bowled specimens with short stems that project slightly beyond the bowl, are much more common, particularly in Upper Republican and related sites (Strong, 1935, pl. 16, fig. 1). The long-stemmed variety with perforated crest appears to be a later, possibly protohistoric and historic, development; whether it antedates the historic calumet type of bowl, which it somewhat resembles, I do not know. The high-bowled short-stemmed L-shaped pipe occurs in considerable numbers in the protohistoric sites of central Kansas (Udden, 1900, p. 57; Jones, 1929, p. 124), eastward at least to Marion County and south to Cowley County. What appear to be virtually identical specimens have been reported from the Red River valley in Lamar County, Tex. (Jackson, 1933, pl. 81 and pl. 15, No. 36; Sanders site ?); the Burkett site in Nebraska (Wedel, 1936, pl. 8, *h*); and Taos, N. Mex. (West, 1934, pt. 2, pl. 195, fig. 9). In the Kansas-Nebraska region, so far as present evidence is concerned, the type is protohistoric, and its greatest concentration is in and just east of the great bend of the

Arkansas, where it is associated with an archeological complex similar to that at the Tobias site.

*Catlinite objects.*—Other than pipes and pipe fragments, there are but two specimens of worked catlinite from the site: one from mound 4, the other from mound 6. The first is a small flat subrectangular piece with slightly convex sides and rounded corners, and is smoothed but not polished. It measures 30 by 18 by 3 mm. The second is oblong, with one end somewhat tapered. It is concavoconvex in transverse section, and may have been readapted from a pipe fragment. It is 25 by 9 by 2.5 mm. Neither specimen is drilled or otherwise marked on either surface, excepting a few striations, and the purpose of the objects is conjectural.

*Turquoise bead.*—Here may be noted the isolated find of a small turquoise bead in mound 17, basin 1. It is of a good grade sky-blue stone, well made and polished. The bead is 2.5 mm. in diameter, 0.6 mm. thick, and has a perforation 0.7 mm. across. It may have been part of the necklace described elsewhere (p. 296), but of this we cannot be sure. Undoubtedly, this and other turquoise beads from the site are of southwestern origin, probably traded to the Indians of central Kansas as finished pieces.

*Sandstone disks.*—There are eight of these curious objects (pl. 44, *a–e*), all made of brown Dakota sandstone. Four fragmentary specimens were perforated more or less centrally, and in a fifth the boring seems to have been begun but not carried to completion. All the fragments were broken through the perforation, and consist of half or less of the original disk. Thickness varies considerably, and the outline seems to have approximated, but not very closely, a perfect circle. Radius varies from 27 to 35 mm., thickness from 10 to 17 mm., and the biconical perforation was 7 to 13 mm. across. The faces were dressed flat; the edges were squared or rounded. There are no markings of decorative or otherwise purposeful nature on any of the specimens. Two are from pit 1, one is from pit 3, and the fourth is from mound 17, basin 1.

The incompletely drilled specimen is subcircular, with the edges clearly ground down. On one face is the imprint of a fossil Sassafras[24] leaf, and the disk has obviously been shaped to include the entire leaf (pl. 44, *b*). On this face is a poorly centered hole about 10 by 15 mm. across by 10 mm. deep; on the opposite face is a shallow pit probably intended ultimately to meet the first hole. The specimen measures 85 by 78 by 20 mm.; it was found in pit 1.

The three imperforate disks are smaller, but in all the faces have been dressed or smoothed and the edges rounded off. Thickness varies from 8 to 12 mm., diameter from approximately 30 to 58 mm. Two of these are from mound 17, pit 8A; the third is from pit 1B.

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[24] Identification by Dr. Roland W. Brown, U. S. Geological Survey.

From pit 3A came a small circular sandstone object with biconvex cross section, and measuring 22 mm. in diameter by 12 mm. thick. I have not been able to satisfy myself to what extent the form is natural, i. e., concretionary, or artificial.

*Miscellaneous objects.*—From mound 17, pit 8A, was taken a circular biscuit-shaped object of sandy limestone averaging 44 mm. in diameter by 25 mm. in thickness. The flat surfaces have been smoothed, and one is crossed by incised lines. A deep, narrow, undulating incision encircles the specimen roughly midway between the two flat surfaces. I am unable to suggest what use this piece may have served.

In the same pit was found a thick flat sandstone ring 36 mm. across by 12 to 16 mm. thick, with a 15 mm. cylindrical perforation. The edges are squared in cross section and, like the surfaces, have been rubbed down.

From pit 1B came an irregular quadrilateral slab of fine-grained white sandstone measuring 95 by 80 by 22 mm. The slightly hollowed and worn upper surface is stained dark red, presumably from the grinding of pigment.

Pit 1A yielded a triangular wedge-shaped piece of sandstone, with both faces moderately smoothed; the thinned edge, 40 mm. long, suggests use as a saw or cutting implement.

## UNWORKED STONE

*Concretions.*—Two specimens are included here. One, from pit 3, is bilobate with constricted midportion. It is 58 mm. long, and there has been little, if any, modification of the natural form. The second specimen, from mound 17, basin 1, is subspheroidal but seems to have been modified somewhat. It is of fine-grained light-gray sandstone, and measures 52 by 45 mm. in diameter.

*Pseudomorphs.*—There are three of these curious objects. One, from mound 6, is flattened subcircular, measures 48 by 35 mm., and is of brown sandstone. The second, from mound 17, basin 2, is of purplish sandstone, 24 to 26 mm. in diameter, and has 12 or more facets. It possibly is a pseudomorph after garnet.[25] The third piece, from mound 17, pit 8, is flattened circular in shape; one half has a suggestion of facets like the preceding, the other half is smoothly convex. It measures 58 by 47 mm.

The purpose for which these pseudomorphs were carried into the village is, of course, not known. They may have been fetishes or good-luck charms, but this is sheer guesswork.

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[25] Identification by E. P. Henderson, U. S. National Museum.

*Pigments.*—A number of variously shaped irregular lumps of nonmetallic hematite are striated and faceted from the removal by grinding of red pigment material. With one possible exception, all specimens appear to be natural lumps of mineral rather than prepared cakes. The possible exception, from mound 6, is a soft granular fragment with one rounded surface and an irregular fracture face; it rubs off bright red on the skin. It may be nothing more than highly ferruginous weathered stone, but its dissimilarity to any other specimens from the site suggests that it may be a prepared ball or cake of paint material.

### OBJECTS OF SHELL

The shells of fresh-water mussels were surprisingly plentiful everywhere in our excavations. Most are unworked, but artifacts made of shell were rather more plentiful and varied than in most other known Central Plains horizons. There is no way of determining to what extent, if any, shellfish formed a part of the native diet, or whether, as among some later Plains tribes, their use as food was frowned upon. Quite possibly children playing in the nearby stream carried an occasional bivalve back to the village, but this is hardly an adequate explanation. Since only a relatively small proportion of the shells have been worked, it seems not unreasonable to explain the presence of the remainder as a byproduct of the food quest. All of the forms present are, or formerly were, locally abundant, and were probably gathered from the Little Arkansas River in the vicinity of the site. In order of their abundance, they include the following 10 species, with an asterisk preceding those which have been recognized among our worked specimens:

***Proptera alata megaptera* (Raf.)
*Uniomerus tetralasmus* (Say)
*Strophitus rugosus* (Swainson)
**Quadrula pustulosa prasina* (Conrad)
**Pleurobema coccineum* (Conrad)
*Quadrula quadrula* (Raf.)
**Amblema costata* (Raf.)
*Elliptio dilatatus* (Raf.)
*Ligumia subrostrata* (Say)
*Lampsilis ventricosa occidens* (Lea)

*Beads.*—This includes all circular centrally perforated specimens under 15 mm. in diameter. There are but four examples. Two, both from mound 17, basin 1, are saucer-shaped, i. e., have a concavo-convex cross section, are circular or slightly elongate, and the central perforation is about ⅓ the diameter of the bead. They are 7 mm. in diameter, and because of their thinness are quite fragile. The identity of the shell cannot be determined, but the finished specimens closely resemble certain types of *Olivella* beads of the Southwest (Kidder, 1932, p. 185). On present evidence, it is impossible to be certain whether our specimens are copies, trade pieces, or merely happen to resemble the types cited (pl. 47, *c*).

Two other beads from mound 17, one from basin 1, the other from basin 2, are flat or nearly so, with dressed edges, and were evidently cut from heavier pieces of unidentified shell. They are 12 to 14 mm. in diameter and 2 to 3 mm. thick. One has a 2.5-mm. hole, the other is unbored. They closely resemble in size and appearance the specimens from the "shell bead burials" or ossuaries of southern Nebraska (Strong, 1935, pp. 116–124).

*Pendants of whole shell.*—There are 11 of these, the only modification of the shell being that achieved in the process of perforating for suspension. Characteristically, the perforating was done by rubbing down the back at, or immediately below, the umbo until a small usually somewhat irregular opening 4 to 10 mm. in maximum diameter had been made into the interior (pl. 46, *2*). Two specimens differ in that each has a deep narrow cut transverse to the long axis of the shell, just below the umbo (pl. 47, *a*, *b*). Shells under 45 to 50 mm. in maximum diameter seem to have been preferred, though two broken specimens must have considerably exceeded this figure. All are weathered and chalky, and little or no evidence of string wear can be detected at the edges of the perforations.

Among the shells so used are *Q. pustulosa prasina* (7), *P. coccineum* (2), and *A. costata* (1). There are 5 specimens from mound 17, basin 2 (including 2 from pit D), 3 from mound 17, basin 1, 2 from mound 17, pit 8, and 1 from pit 1B.

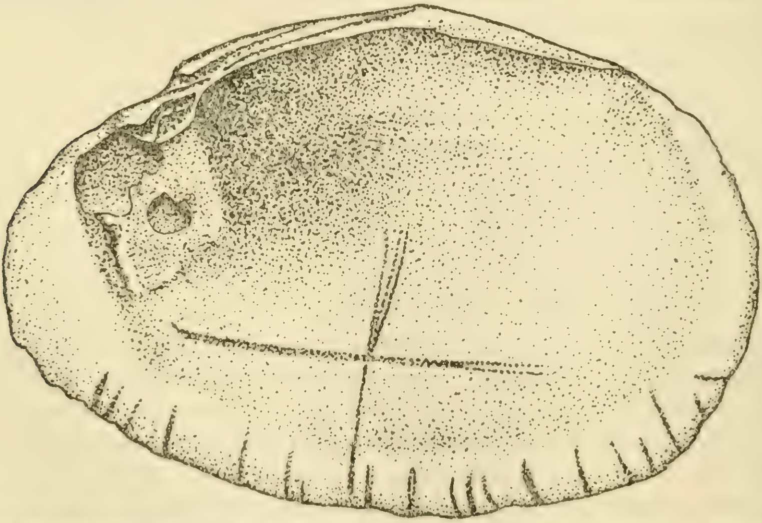

FIGURE 58.—Notched and incised shell from basin 2, mound 17, Tobias site. Actual size. (USNM 388931.)

*Pendants of cut shell.*—Pendants in which the original contours of the shell have been so far altered as to preclude species identification include both circular and noncircular forms. All our examples, of whatever form, are from basins 1 and 2 of the mound 17 complex. Two are circular or approximately so (pl. 46, *2*). The larger is approximately 43 mm. across, less than 2 mm. thick, and has a slightly concavo-convex cross section. From the concave surface have been bored, slightly off center, two holes 13 mm. apart and about the same distance from the edge. The piece is well made and nicely finished. The second specimen is somewhat elongate, 31 by 36 mm. in size, and has a single hole bored near one long side so the pendant would hang with its long axis horizontal.

Noncircular pendants include one flat ovoid specimen, 24 by about 16 mm., pierced at the smaller end; a subrectangular piece with rounded corners, measuring 10 by 29 mm., and having a small hole near each end; and a group of 17 small thin variously shaped examples that clearly were used together. In this latter group, the few whole pieces (pl. 47, *top row*) are ovoid, ovoid with straight base, trapezoidal, or subrectangular; most seem to have, or had, two perforations near one end, always the smaller in tapered specimens; one has three perforations; and complete pieces vary from 16 to 24 mm. long and from 10 to 15 mm. wide. The thinness of the shell suggests some small fresh-water mussel; and judging from their clustered occurrence when found they must have been strung together when lost.

Finally, there are two long, narrow, thick, tapered objects (pl. 46, *2*) whose manner of use is not clear. Both are straight, with one end cut square and the other pointed. Maximum thickness is near, but not at, the blunt end. One is well finished; the other still has the cut edges and has not been smoothed down. They are 40 to 43 mm. long, with maximum diameter of 7 to 8 mm. Neither is perforated, grooved, or otherwise obviously prepared for attachment to a cord. It seems improbable that they could have been cut from the shell of any species identified from the site, unless much larger examples than those in our series were available; they, or the shell used, may have been imported.

*Spoons* (?)—Ovoid or elliptical scooplike objects were made by grinding down the entire perimeter of a suitable shell, and also removing the hinge and any other surface irregularities. The only complete example we have, which is symmetrical and well made (pl. 46, *2*), measures 108 by 60 mm.; it came from mound 17, basin 2. From pit 1 came the rounded end fragment of another specimen, with ground edges, probably representing a similar, but larger, implement. That they were actually spoons is, of course, problematical, but they could have been so used. I doubt that they were ornaments since neither of our specimens is pierced or otherwise provided with means for attachment. Both are made of the shell of *Proptera alata megaptera.*

### PERISHABLE MATERIALS

*Coiled basketry.*—Of exceptional interest are the charred remnants of a coiled basket found inverted on the floor of basin 2, mound 17, at the Tobias site (pl. 25, *c*). The upturned bottom had largely disintegrated and at no point was it possible to trace any of the coils completely around the basket. The remains were repeatedly treated in situ with a fixative and were removed en bloc; but unfortunately they survived the trip to Washington only as fragments. Analysis of construction methods is handicapped by the presence of a heavy coating of scorched organic matter on the inner surface.

As measured before their removal, the remains were those of a shallow circular bowl or tray approximately 22 cm. (8½ in.) in diameter and perhaps 6 or 7 cm. deep. The basket had been constructed on a foundation of single rods, 3 to 4 mm. in diameter and of uniform size throughout their traceable length. The sewing element consisted of splints averaging 1.5 mm. in width. On the outside surface, these splints run diagonally to the foundation at an angle of 40 to 50 degrees; and each stitch is caught under one of the preceding coil. I suspect the coiling proceeded in clockwise fashion. There are 5 to 6 coils, and about the same number of stitches, per inch. The plant materials used are unidentified.

In its original size and shape, this basket probably approached rather closely those used by the Plains Indians in their dice games (Culin, 1907, figs. 22, 24, 32, 34, 108). According to Weltfish (1930, p. 470), there were two types of these coiled gambling baskets; and one of these types made by the Pawnee, Arikara, and perhaps the Mandan, had "a single willow-rod foundation and [was] sewn with heavy willow sewing thread." Moreover, the stitches were usually interlocking. This characterization fits the present archeological specimen quite well; and it may be suggested that we have here a mid-16th century example of a basketry type widely distributed among the later historic Plains tribes.

*Textiles.*—A short section of twisted grass or shredded corn husks was found in basin 2, mound 17. It consisted of two elements which, viewed end on, show a counterclockwise twist; each of these elements in turn appears to be made up of smaller fibers with a clockwise twist. The fragment is 55 mm. long; it may have been cordage or coarse mat-weaving material. One or two burned lumps of roofing clay from this basin bore twisted cord imprints that were about the size of this specimen.

*Wood.*—On the floor of basin 2 in mound 17 was found a small bundle of straight sticks, preserved by partial charring. They averaged 6.5 to 7.5 mm. in diameter, and 35 to 40 mm. long, but their original length may have been appreciably greater. One end of each was tapered, exposing the pith cavity, and all seem to have been stripped of their bark. While none shows indisputable proof of cutting or other modification, their grouped occurrence near other carbonized materials was probably not fortuitous. They were of suitable diameter to have served as arrowshafts, or as rods for a screen or curtain.

From basin 1, mound 17, came 4 flat rectangular slips of wood, each broken at one end and apparently cleanly cut at the other. The edges were straight and the surfaces were scraped smooth. They average 3 to 4 mm. thick, 7 to 13 mm. wide, and 21 to 69 mm. long.

### OBJECTS OF EUROPEAN MANUFACTURE

That the inhabitants of the Tobias site were in contact with Europeans is strongly suggested by the discovery of iron, copper, and glass objects, all under conditions that rule out any possibility of a postoccupational intrusion. Interestingly enough, these objects were found only in basins 1 and 2 of the mound 17 complex; none are recorded from the cache pits or from refuse mounds 4 and 6.

Of primary interest in connection with this material is, of course, the question of its source, its period, and the nationality of its purveyors. Unfortunately, none of these points can be conclusively established from our evidence, for there are no visible trader's or maker's names or marks and I have been only partially successful in locating comparable forms from other datable and assumedly more or less contemporaneously occupied sites. Moreover, so far as I have been able to determine, none of the trade items is of a type that would not have been available at the time that the Tobias site, for reasons to be presented later, is believed to have been inhabited.

*Iron objects.*—These were in every instance heavily oxidized. From basin 1 were taken an awllike object and several bits of thin sheet or strap iron suggestive of knife blade fragments. They occurred near the north end of the basin, and 18 to 24 inches underground, i. e., 8 to 14 inches above the floor. The awl appears to have been 4-sided, either square or diamond-shaped in cross section, at the middle, whence it tapered to a point at each end; it was 143 mm. long (pl. 36, *l*).

Basin 2 yielded two specimens. One was an iron ax blade, broken vertically through the eye, with the poll missing. The under side of the blade is slightly constricted next to the eye, where it has a width of 36 mm.; thence both upper and lower margins flare to a curved cutting edge 64 mm. long. From the eye to the cutting edge the specimen measures 84 mm., and thickness approximates 8 mm. The size and shape of the eye, and the form of poll, are unknown; and on the pitted surface of the blade no markings or stampings are visible. The flaring margins and small size of the blade are markedly unlike the larger and more nearly straight-backed axheads of English or American make found on early 19th-century Pawnee sites in Nebraska, and the earlier English or Dutch axes supplied to the Iroquois (Beauchamp, 1902, p. 59 and figs. 99, 167) resemble the present specimen even less. In the Rio Grande valley, 16th- and 17th-century Spanish axes tend to have longer narrower blades, but I am informed that a blade "almost identical" to our specimen was found at Quarai [26] in what is now eastern Valencia County, N. Mex. There is other evidence that the inhabitants of the Tobias site were in contact with peoples of the Rio Grande, and it seems more likely therefore that our specimen is of Spanish origin than that it reached central Kansas from the east (pl. 36, *k*).

The second specimen from basin 2 is an irregular flat kidney-shaped mass with adhesions of charcoal, twig moulds, and other extraneous matter. The mass is slightly magnetic, and tends to split; it measures about 55 by 40 mm. Its original form and the nature of the object cannot be ascertained.

*Copper objects.*—Copper occurs only as small strips rolled, or with the ends folded over, to form tubular beads or beadlike pieces. There are three examples, all from the floor of basin 2. The largest is elliptical in cross section, and measures 12 by 9 by 5 mm. It was made by folding one end of a 20 by 12 mm. strip over the other, and pressing the overlap tightly together. It may have been fashioned around a thong or cord as a "dangler," but of such a cord there is no trace. The other two specimens are 10 by 5 mm. and 5 by 3 mm., and show the same method of construction.

*Glass objects.*—Scattered through the fill of basin 1, at depths of 18 to 35 inches underground, were five glass beads. All are slightly asymmetrical, but basically are subspheroidal in form with flattened surfaces at right angles to the perforation. They are of pale-blue glass, slightly iridescent, with finely pitted surface, and are unquestionably of white man's manufacture. Diameter varies from 5 to 7 mm., thickness from 4.5 to 6 mm., and the perforation is 1 to 1.5 mm. in diameter. They conform in all particulars to those in the necklace described immediately below, and may once have formed a part of it.

*Glass, turquoise, and bone necklace.*—Among the items of particular interest from the Tobias site was this assemblage of some 250 beads and pendants. The objects lay in a cluster (pl. 25, *b*) on the floor of basin 1 in mound 17, beside a large postmold and about a foot from the southwest wall of the basin. As found, there was no trace of a string, but painstaking excavation showed that many of the beads still lay in juxtaposition so that they could be restrung, in part, in their original order. That the objects once formed a necklace there can be no reasonable doubt, and even the general arrangement of the various types of beads as restrung is believed to be substantially correct (pl. 46, *1*, *left*).

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[26] Information by Miss Marjorie F. Tichy, curator of archeology, Museum of New Mexico, Santa Fe.

The necklace at present includes 144 glass beads; additional fragments suggest there were originally between 150 and 160. They are dull whitish, irregular in size, and have pitted surfaces; but when wet, and while immersed in a preservative, they have an attractive light-blue color. Their present appearance may be a result of weathering. In general, they are about the size of a pea and globular in form with flattened surfaces at the ends of the perforations; diameter ranges from 4.5 to 7 mm.

Bone beads number 38, with pieces of perhaps half a dozen more. They are 7 to 18 mm. long, by 1.5 to 3 mm. in diameter, and bear no incising or other hint of decoration. They served as spacers between groups of glass beads.

At the lower end of the original necklace both strands came together and passed through a shell cylinder 4.5 mm. long by 5.5 mm. in diameter. Immediately below this was a polished oblong turquoise pendant measuring 15 by 13 by 3 mm., with a perforation at the smaller end. Below this, in turn, was a short loop with 32 flat circular turquoise beads, 1–2.5 mm. thick by 4 mm. in diameter, and averaging 14 to 16 per linear inch. A thin circular centrally pierced shell disk, 15 mm. in diameter, divided the turquoise beads into two groups of 15 and 17 each. The turquoise is of good quality and beautiful color, and has resisted decay far better than the glass beads.

As to the accuracy of the reconstruction, the turquoise beads and the shell disk divider are unquestionably in correct order. The placement of the turquoise pendant and shell tube is less certain, since they had been slightly displaced apparently while underground. Above this point, to a distance of 27 cm. from the turquoise beads, the glass beads and bone spacers lay in order in the following sequence, wherein the number indicates glass beads and B denotes single bone tubes:

2–B–5–B–5–B–4–B–2–B–4–B–5–B–1–B–5–B

The other side of the string was reconstructed to match this sequence, and the remaining specimens were then arbitrarily strung with groups of two to five glass beads separated by bone tubes.

From the location of the find it may be surmised that the necklace was perhaps cached away in the ceiling interstices of the structure near the top of the post, falling to the floor when the roof collapsed. There is no charring or scorching on any of the component elements, and there seems to have been little disturbance of the trinket once it reached the floor.

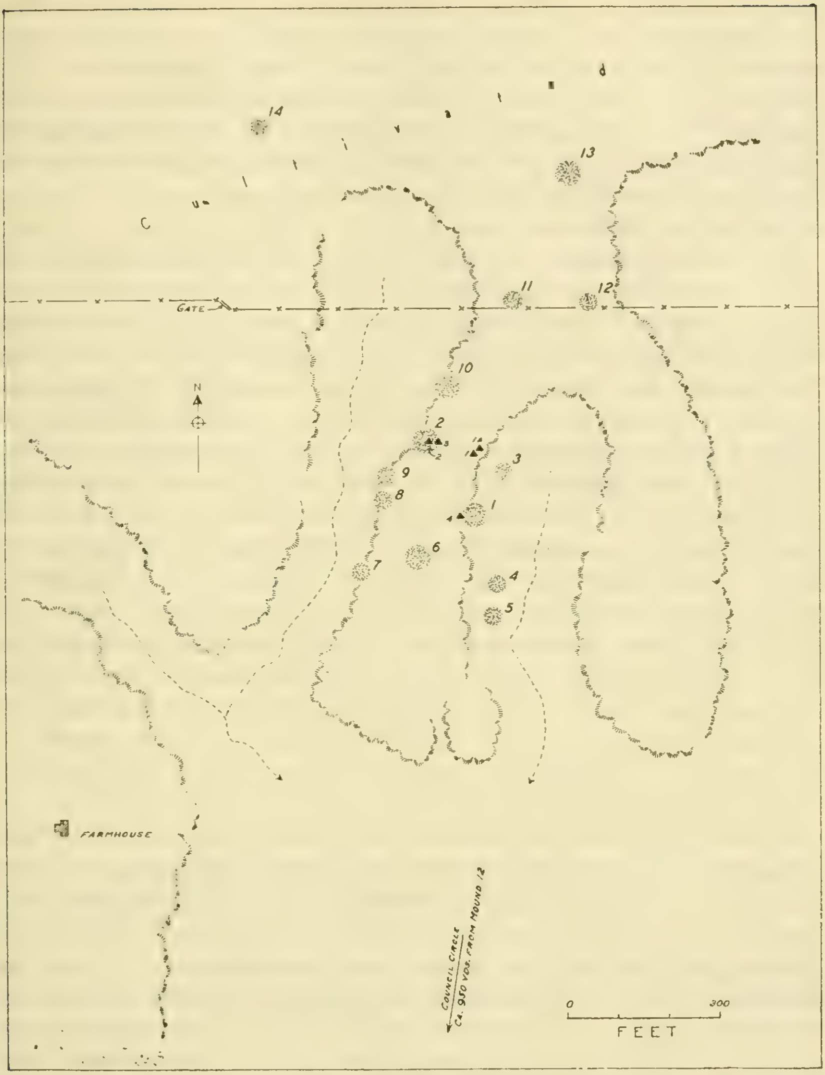
It would be interesting to know whether the necklace was brought in as a finished piece or was made on the site. The turquoise beads and pendant were very likely imported from the upper Rio Grande area, and the glass may have come from the same direction, though ultimately certainly of white man's manufacture. The bone tubes and shell objects could have been made locally.

### THE THOMPSON SITE (14RC9)

In course of our investigations at the Tobias site and elsewhere in Rice County, local collectors from time to time brought to our camp specimens dug or plowed out of various sites in the county. Mostly these objects included raw materials available to, or products made by, the local Indians and could be readily duplicated by the specimens recovered in our own researches. There were also occasional exotic items and materials, including obsidian, bits of turquoise, and, most intriguing of all, rare potsherds bearing glaze-paint decoration. These glaze-paint sherds were for the most part surface finds, but through the enthusiastic cooperation of Horace Jones, of the Lyons Daily News, we were able to learn at last that several had been dug out of a mound on the C. F. Thompson farm just across the river from the Tobias site. In hopes of finding more such fragments, in situ, and thereby getting a cross-date with the Rio Grande pottery sequence, we accordingly undertook limited explorations on the Thompson property.

The Thompson site (fig. 59) lies about 450 yards northeast of the Tobias site, across the valley of Little Arkansas River. Here the rolling uplands from the north end in a series of narrow south-pointing tongues separated by short dry ravines. Atop one of these sloping tongues, in unbroken sod overlooking the wooded valley bottoms, is the site. It consists of 10 or more artificial mounds, with at least 4 others faintly discernible in cultivated rising ground immediately to the north. The site covers considerably less ground than does Tobias, but, like it, is strung out along a ridge which did not permit much lateral expansion. Curiously enough, no mounds or other remains were noted on the nearby ridges to east and west, though they would seem equally well suited to occupancy (pl. 48, *a*).

At present the nearest source of surface water is the Little Arkansas, nowhere less than 250 or 300 yards distant. The descent to the bottoms is more gentle than that at Tobias, and the sandstone ledges at the tip of the site ridge are relatively inconspicuous. That springs ever issued from their base appears unlikely, though the deeply cut draw southwest of the site had a small wet spot suggesting a seep at the time of our first visit in mid-June. This was dry a month later.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GATE
10
N
2
2
1A
3
9
8
1
4
6
7
4
5
FARMHOUSE
COUNCIL CIRCLE
CA. 950 YDS. FROM MOUND 12
0
300
FEET

FIGURE 59.—Sketch map of Thompson site, 14RC9, Rice County. Stippled circles indicate refuse mounds noted in 1940; solid triangles, cache pits excavated. Puebloan sherds from cache pits 1A and 2, mound 2; chain mail fragments from pit 4, mound 1.

Other than the partly dug mounds and some detritus on the field to the north, there was little surface evidence of native occupancy. Pits were rarely visible, though systematic tests revealed the location of 3 or 4, and it is a safe guess that many more exist. Noteworthy is the absence of a "council-circle"; local informants unanimously agreed that no such complex had ever been noted here. We may point out, however, that the ditched mound previously described as lying several hundred yards east of the Tobias site, lay only a little farther from the Thompson site. Almost due south across the creek, this circle is screened from the Thompson site only by the fringe of trees along the stream. It may or may not have served the occupants at this site. The Tobias site, too, is hidden by woods; if the creek bottoms contained less, smaller, or no timber in Indian days, the two sites and the isolated "council-circle" would have been easily visible from, and within hailing distance of, one another.

The mounds on this site showed no obvious superficial difference from those on the Tobias site, except that one or two appeared to be somewhat larger. Of the 10 still in sod, 5 were strung along the west rim of the ridge, 4 were on the east slope, and 1 lay on the ridge top. The area covered by this cluster did not exceed 100 by 175 yards, but it is probable that a considerably larger area of occupation to the north has been obscured by modern farming operations. For our purposes, we assigned an index number to each mound (see fig. 59), and then selected the two largest for trenching. Mound 1, first pointed out to us as that from which the glaze-paint sherds were taken, was bisected by an east-west trench 5 feet wide, with a shorter trench at right angles from the center to the south edge. Operations were shortly transferred to mound 2, upon the strong recommendation of County Commissioner Phil Hohl who is said to have dug out the puebloan sherds. These two mound tests, together with the opening of five cache pits, constituted the extent of our excavations.

### MOUND 1

Mound 1, on the east slope of the ridge, was low and spreading, with a diameter of about 45 feet, and an apparent height of nearly 3 feet (pl. 48, *b*). Small sodded depressions near the highest point on the south half testified to sporadic test-pitting in the past. To our disappointment, the T-shaped trench revealed that the mound had been built upon a slight rise and that the undisturbed subsoil was nowhere more than 24 inches below the mound surface. Relatively little admixture could be detected at depths greater than 18 or 20 inches, save in the ever-present rodent burrows. The fill generally consisted of a dark grayish-brown soil containing some ash, bits of charcoal, animal bones, flint chips, sherds, and miscellaneous broken and unbroken artifacts. Beyond a gradual thinning out numerically as subsoil was approached, there appeared to be no significant difference in distribution or type of cultural materials. There was no trace of postmolds, fire basins, or other features in our cuts, and nothing to indicate that the mound was not an accumulation of refuse from nearby habitations. This identification is substantiated by the location of the mound on a slope which, though gentle, would almost certainly not have been picked for a lodge site so long as the much more suitable ridge top was available.

At the west edge of the mound, and visible as a shallow surface depression, was a cache pit. This, No. 4 in our series, contained in its upper portion about 30 inches of ashy soil strewn with discarded artifacts and trash, which blended into the thin midden deposit of the partly overlying mound. Near the south side of the pit in the undisturbed lower ash lenses, was a rusted mass of iron rings, since identified as chain mail. Below this was 36 inches of hard almost sterile soil, underlain by nearly 12 inches of finely laminated silt apparently laid down while water stood in the open pit. Pottery fragments, worked scapulae, scrapers, drills, arrowpoints, and other artifacts from the upper part of the cache were the same as those found in the overlying mound.

Of particular interest in the mound material was a small cachelike deposit of household implements on the east side of square 5, at 15 inches depth. Included were a crude grooved maul, a large muller, a bone hoe, an awl, and a small mortar. In square 15, at 7 inches depth, was half of a badly rusted iron ring slightly less than a half inch in diameter. This undoubtedly is chain mail. Charred corncob fragments and kernels were scattered through the mound fill and in the cache. There were no puebloan sherds.

### MOUND 2

Mound 2 lay approximately 170 yards northwest of the preceding, on the west rim of the ridge. Its diameter was about the same, and the height was under 2 feet. Most of the central area had been completely dug over in the fairly recent past, so that only the east and west ends of our 3-foot cross trench yielded any reliable data. In these undisturbed portions the fill was very hard, compact, and dark in color, with the expectable small quantities of cast-off sherds, animal bones, chips and stones, and an occasional artifact. This material did not exceed 16 or 18 inches in depth, except where cache pits directly underlay the mound.

A scant foot east of the central disturbed area but clearly in unmolested mound fill, at a depth of 15 inches, were found 3 red-slipped sherds with glaze-paint decoration. Under these, and partially underlying the old diggings, was a cache pit. There was no evidence in our trench wall that this pit had ever extended up into or through the mound fill, and it seems evident that the cache had been filled in before mound deposition began. No great time lapse is implied, and it is possible that the mound accumulation was localized here because the Indians simply continued to dump trash on and over abandoned caches after these had been filled up. The puebloan sherds are believed to have lain at the bottom of the mound and on top of the older cache pit. Very probably, too, they are a part of the same imported vessel or vessels represented by the similar sherds previously dug from the central part of this mound. But in any case, whether in mound fill or cache pit, they were certainly inclusive, and their association with pottery of strictly local manufacture establishes a contact point between Southwest and Central Plains sequences.

### CACHE PITS

The five cache pits excavated did not differ significantly from those opened at the Tobias site. All were large, with capacity of 50 or more bushels each, and at least two showed evidence of a grass-lined floor. All contained strata of hard soil with few ashes or artifacts, suggesting deposits of earth perhaps dug from other pits and dumped into abandoned structures. It may be noted that in two or three instances, and particularly in the lower 12 inches of pit 4, there were flat-lying laminae of fine silty material, suggesting the deposition of wind-blown material in standing water. It appears unlikely that the Indians would leave 6- to 7-foot holes open for any length of time; at night, or with children about, they would endanger life and limb. Yet it is difficult to see how the laminated silts would be deposited in any other way. The measurements and other data on pits are summarized below (table 7).

TABLE 7.—*Data on cache pits at Thompson site (14RC9)*

| Pit No. | Diameter | | Depth | Remarks |
|---|---|---|---|---|
| | Top | Bottom | | |
| | *Inches* | *Inches* | *Inches* | |
| 1 | -------- | -------- | -------- | Notes contain no overall measurements; top 6 inches of gray top soil, then 36 inches of ash; much bison and turtle bone; charred cob at 32 inches; bone awls, needle, projectile points, etc.; grass-lined floor. |
| 1A | 43 | 64×66 | 74 | Cylindrical neck to 38 inches; grass-lined floor; puebloan sherd at 63 inches depth, in undisturbed ash lens; little ash; scored rib, bone "paint brush," etc.; intrusive into north side of pit 1. |
| 2 | 88 | 90 | 89 (70) | Underlay mound 2, overlain by ca. 16–18 inches of mound midden with puebloan sherds at contact; fill of yellowish clay with some ash and charcoal; cultural material concentrated near center of pit. |
| 3 | 63 | 63 | 44 | Visible as slight depression at east edge of mound 2, ca. 2 feet east of pit 2; hard soil with some charcoal, sherds, etc., in upper 36 inches; soft ashy mix, few artifacts in lower 8 inches. |
| 4 | 48 | 80 | 78 | Visible as slight depression at west edge of mound; upper 30 inches ashy midden with artifacts, etc.; 36 inches of hard sterile soil; bottom 12 inches laminated silt deposit (water-laid?); mass of iron rings 12 inches from south side at 30 inches depth (chain mail). |

### THE ARTIFACTS

Since we dug much less extensively at the Thompson site than at the Tobias site, the artifact collection available for examination from the former is much smaller. Also, there are fewer whole specimens, and we are forced to rely for comparisons largely on fragmentary examples and shorter series. Finally, a number of artifact types occurring exclusively, or nearly so, in the basins of the mound 17 complex at Tobias were not found at Thompson. With due allowance for these factors, and particularly for the last, it is, nevertheless, evident that the material culture inventory at Thompson closely parallels that found in the pits and refuse mounds at Tobias. Certain differences in detail are apparent, but these may well be due to individual or familial variations in taste and habit or to a probably slight disparity in time. At any rate, the ensuing descriptions are briefer than those for the Tobias artifacts, and for additional details on particular forms or artifact types the interested reader is referred back to the relevant section on similar items from Tobias. Exceptional or deviant specimens, of course, will be treated in appropriate detail.

### FOOD REMAINS

*Maize.*—This undoubtedly important item in the native subsistence economy was disappointingly scarce in our workings. Charred kernels were noted here and there throughout the mounds and pits, but nowhere in any quantity; and there are but two small cobs, both incomplete. One, from pit 1A, measures 27 mm. long by 12 mm. in diameter, and was apparently 10 rowed. The other, from mound 1, is 22 by 12 mm., and was 8 rowed.

No trace of beans, cucurbits, or other vegetal food materials, domestic or wild, were noted.

*Molluscan remains.*—These are included here with some reluctance, since there is no evidence whether the natives did or did not eat shellfish. There were, however, no worked shells in that portion of the deposits we examined, and it is not certain that the native potters incorporated crushed or burned shell into their manufactures. On the assumption, then, that shellfish may have been consumed occasionally or by certain individuals, we may note that five varieties of fresh-water mollusks were represented by 10 specimens. Whether the natives went beyond the Little Arkansas River at their doorstep to gather this material, I do not know. The first three species listed were also present at the Tobias site. Included in our series are the following specimens:

| | |
|---|---|
| *Quadrula pustulosa prasina* (Conrad) | 1 |
| *Uniomerus tetralasmus* (Say) | 3 |
| *Strophitus rugosus* (Swainson) | 3 |
| *Lampsilis anodontoides* (Lea) | 2 |
| *Bulimulus dealbatus* (Say) | 1 |

*Turtle remains.*—From pit 1 were taken a few skeletal parts of the box turtle (*Terrapene*); there is no evidence that the carapace had been worked.

*Mammalian remains.*—Bones of the following mammals were identified from the Thompson site in the numbers indicated:

| | |
|---|---|
| Bison (*Bison bison*) | 26 |
| Dog (*Canis familiaris*) | 9 |
| White-tailed deer (*Odocoileus virginianus*) | 6 |
| Antelope (*Antilocapra americana*) | 2 |
| Dog or wolf | 2 |
| Elk (*Cervus canadensis*) | 1 |
| Jackrabbit (*Lepus californicus*) | 1 |
| Wolf (*Canis lupus*) | 1 |

### POTTERY

There are from the Thompson site no whole or restored vessels; our sample includes 2,387 potsherds, of which 2,118 are body fragments and 269 are rim pieces. The number of vessels represented by this sample, judging from the rim variations, probably exceeds 150.

Of the total number of sherds 88 percent, including all rims, are sand-tempered gray wares. The gray ware body sherds can be further subdivided, on the basis of surface treatment, into the same two varieties found at Tobias—Geneseo Plain and Geneseo Simple Stamped (p. 233); the rims cannot with certainty be allocated to one or the other of these closely related wares, and so are separately discussed below as a group. Of the body sherds, 76.3 percent are classed as Geneseo Plain and 10.4 percent as Geneseo Simple Stamped. These proportions and ratio are not significantly different from those at Tobias; and, as shown in table 8, the percentages for the site as a whole are approximated in practically every excavation unit except pit 1A. It can be safely concluded, I think, that these two gray wares were the standard domestic pottery of the site.

Absence of whole or restorable vessels and the generally small size of the rimsherds make a determination of rim form and position difficult. There is evidence, however, of straight vertical to slightly flaring examples and of others that were gently outward curved; heights of 3 to 6 cm. seem to have prevailed, and decoration is either absent or occurs only on the lip, which is almost invariably rounded. About one-third of the lips are undecorated, and an approximately equal number bear short diagonal cross incisions; "pie-crust" scalloping, punctating, and herringbone incising occur in diminishing frequency (fig. 60, *b*, *c*, *e*). Seventy-five rimsherds have a single plain (27) or diagonally incised (27) fillet, or two parallel plain (2) fillets, or alternatively a single row of pinched-up nodes or fingernail gougings (19) on the exterior about 10 to 25 mm. below the lip (fig. 60, *f–i*). Fifty-six of these, apparently representing at least 43 vessels, came from mound 1, and were further characterized by having, in 36 instances, pie-crust scalloping on the inner upper lip. From the sameness of style and technique I would suspect that most of

TABLE 8.—*Pottery from the Thompson site (14RC9)*

| Body sherds | Mound 1 | | | | | Mound 2 | Pits | | | | | | Sherds | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-6 | 6-12 | 12-18 | 18-24 | Total | | 1 | 1A | 2 | 3 | 4 | Total | | |
| | *Inches* | *Inches* | *Inches* | *Inches* | | | | | | | | | | |
| Geneseo Plain | 257 | 292 (54) | 315 | 76 | 994 | 136 | 139 | 34 | 141 | 8 | 164 | 486 | 1, 616 | 76. 3 |
| Geneseo Simple Stamped | 17 | 14 (9) | 38 | 10 | 88 | 6 | 7 | 102 | 8 | 1 | 8 | 126 | 220 | 10. 4 |
| Genesco Red Filmed | 28 | 49 (4) | 32 | 21 | 134 | 15 | 7 | -------- | 18 | 12 | 18 | 55 | 204 | 9. 6 |
| Other: | | | | | | | | | | | | | | |
| Check Stamped | -------- | -------- | 1 | -------- | 1 | 1 | 8 | -------- | -------- | -------- | -------- | 8 | 10 | -------- |
| Cord-roughened | -------- | 3 | 2 | -------- | 5 | 1 | -------- | 4 | 1 | 2 | 1 | 8 | 14 | -------- |
| Incised | -------- | 1 | 3 | 1 | 7 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 7 | -------- |
| Shell-tempered | 6 | 2 (2) | 6 | -------- | 14 | 7 | 3 | -------- | 12 | 7 | -------- | 22 | 43 | 2 |
| Rio Grande Glaze | -------- | -------- | -------- | -------- | -------- | 1 | -------- | -------- | -------- | 3 | -------- | 3 | 4 | -------- |
| Total | 308 | 361 (69) | 397 | 108 | 1, 243 | 167 | 164 | 152 | 178 | 23 | 191 | 708 | 2, 118 | -------- |
| Rims | -------- | -------- | -------- | -------- | 137 | 34 | -------- | 98 | -------- | -------- | -------- | 98 | 269 | -------- |
| Total (rim and body sherds) | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 2, 387 | -------- |

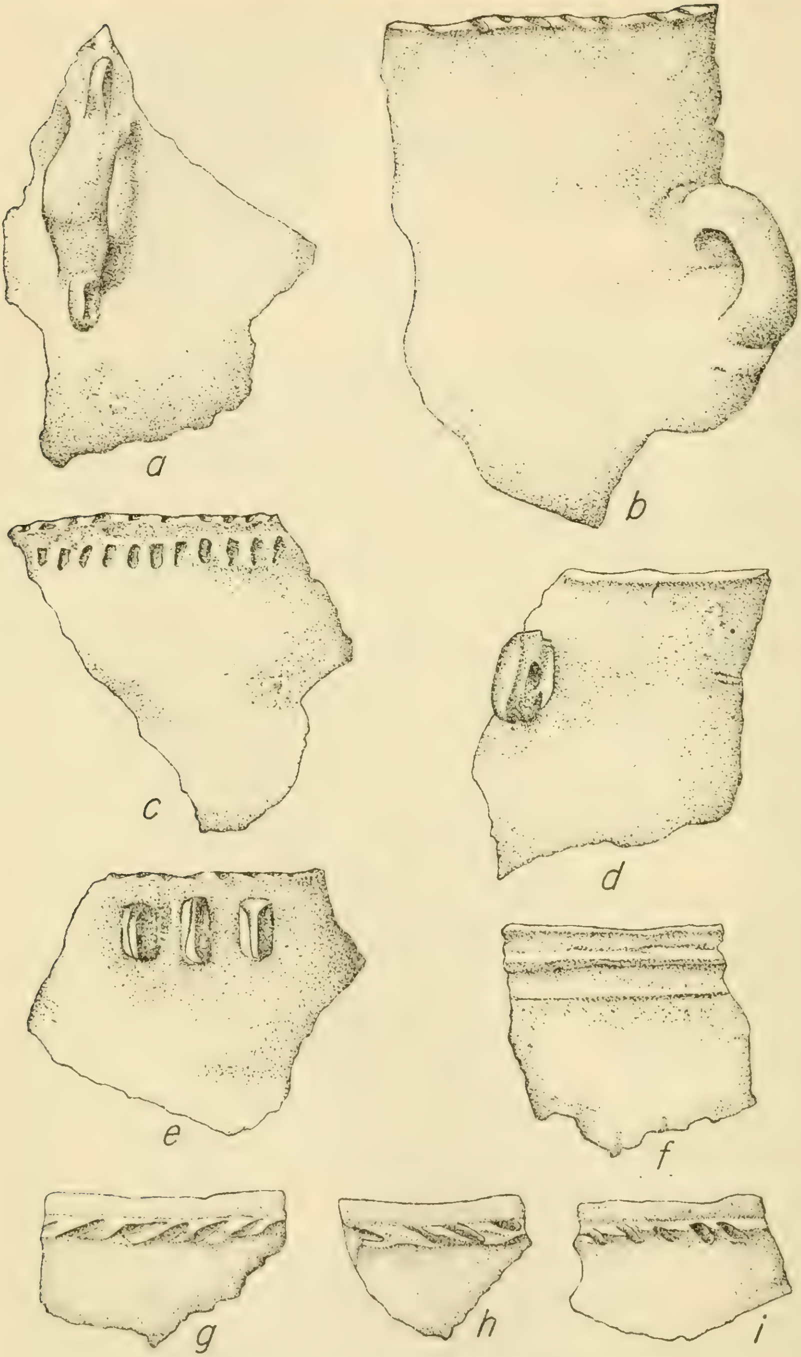

FIGURE 60.—Rim and handle sherds from Thompson site.

the filleted mound-1 rims were from vessels produced by one potter or by a single family group of potters. Filleted rims also occurred, but in relatively smaller proportion, at the Tobias site.

A rimsherd from pit 1 has two laterally flattened applique nodes or flanges, each 15 mm. long by 8 mm. wide by 3 to 4 mm. thick, spaced about 20 mm. apart and an unknown distance below the lip. A restorable rim from the same pit has 12 slightly smaller similarly shaped nodes, arranged in 4 equidistant groups of 3 each around the neck 1 cm. below the lip (cf. fig. 60, *e*). Both vessels may well have been the work of one potter.

Grayware handles are represented by 20 specimens, mostly fragmentary, of which 12 are loop handles with circular cross section and 8 are wide thin strap handles. Examples of handle attachment by insertion of one or both ends, i. e., by riveting, occur with both forms. One or two of the loops have, or formerly had, conical or laterally flattened nodes in one angle, but decoration otherwise was confined to the broader strap handles. Three of these from mound 1 have respectively (*a*) 4 short partly obliterated irregular vertical incised lines; (*b*) 5 vertical incised lines; (*c*) 23 small hemiconic punctations arranged in 6 uneven horizontal rows. Two other short segments, from pit 2, have (*a*) horizontal incisions alternating with single rows of small punctations; (*b*) 8 very erratic vertical incisions, flanked on each edge by a row of small punctations. As at the Tobias site, the decorative work was carelessly done.

A single sherd showing part of a circular flat or slightly concave vessel base came from pit 1; it was evidently from a small urn or jar of plainware with rounded shoulder.

In addition to the foregoing gray wares, Geneseo Red Filmed also occurred, except in pit 1A, throughout our excavations at the Thompson site. As at Tobias, so here it constituted about 10 percent of our collection, and included a very few cord-roughened and simple-stamped sherds. There were no rims, and from the sherds at hand it is wholly impossible to judge vessel form. One small plain faded redware lug with 7 by 10 mm. performation was found in pit 1; and from mound 1 came a sherd with a neat 5-mm. hole made while the clay was soft. There is no evidence that a riveted handle has been pulled out, or that crack-lacing was contemplated; and one is reminded of the pair of unexplained perforations on the incomplete redware jar from the Tobias site (see p. 239, and pl. 27, *b*). Another redware sherd from mound 1 has a scarfed edge, apparently from partial sawing followed by snapping off of the fragment.

Besides the three named wares, that together comprise nearly 97 percent of the sherds, the rather consistent if sparing presence of grit-tempered cord-roughened and of shell-tempered plain fragments should be noted. In mound 1, the former occurred only in the 6–18-inch levels, whereas shell-tempered sherds occurred also in the topmost 6 inches. But our sample is small, and there is in the material no evidence that use of shell-tempering is a later addition to an older grit-tempered tradition—even though, on a regional basis, it can be demonstrated that shell succeeded grit in the potter's art. I am not certain whether the shell-tempered ware is a local product, or was imported from the Cowley County area to the south where it was predominant (p. 359).

The incised sherds, all from mound 1, are mostly of local paste and tempering and are crudely done. One piece has 3 fine lines undulating erratically across a body sherd, and vaguely suggesting a design characteristic of Middle Mississippi pottery at the Steed-Kisker site near Kansas City (Wedel, 1943, pl. 23). Another seems to have had parallel lines in groups that were successively oblique to one another. A third, with white silicious inclusions, has a line-and-dot pattern faintly reminiscent of Oneota motifs. The others are too small to show anything beyond traces of linear incising. If these sherds are of local manufacture, it is quite possible that the tenuous similarities suggested above were the result of attempts by local artisans to imitate the incised wares of neighboring peoples to the north and northeast, where much better made pieces were produced.

### *Trade Wares*

Of especial interest is the finding of four glaze-paint sherds, three of them in or over pit 2, 15 inches underground, and one in disturbed mound 2 soil but by our test trench.[27] As to their inclusive occurrence, there can be no doubt; and their significance is the greater in view of the fact that the same mound had previously yielded sherds of similar type and possibly from the same vessel. The fragments are small; they include one rim segment and one sherd with the stump of a handle. All are red-slipped, and bear black sintered glaze-paint (pl. 49, *a–d*, *g*) decoration. Mera, to whom the sherds were submitted for identification,[28] states (letter of August 13, 1940) that they "represent, without question, late Rio Grande forms which began to appear as early as the first quarter of the 16th century and continued with few changes until about the middle of the 17th century. After this latter date the quality of glaze generally became so poor that I feel sure that your examples can safely be assigned to the period mentioned. All of these would come within my Group E."

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[27] In the preliminary report (Wedel, 1942, p. 6), these sherds were erroneously ascribed to the Tobias site.

[28] Along with 11 others of the same type gathered by local collectors from the surfaces of various unspecified Rice County village sites.

Kidder is also of the opinion (letter of May 6, 1941) that the fragments are "certainly Rio Grande glazes, most of which would be grouped as Glaze IV if they came from Pecos, although they might be somewhat later if from further west. As there are no bowl rims, one cannot be absolutely positive, but I agree with Mera that 1525 to 1650 would certainly cover them. In fact, I would prefer to place them prior to 1550 . . . ." These two concurring opinions would seem to establish with reasonable preciseness the source and period to which the glaze-paint sherds should be attributed.

Six other red-filmed sherds, all from pit 1A and apparently of foreign origin, have not yet been identified. One has broad-line black decoration, a light tan inner surface, and a sandy paste with white inclusions which Mera (op. cit.) suggests is megascopically indistinguishable from the probably much earlier type San Francisco Red. Another is strongly curved, like the neck sherd from a bottle with a prominent flattened perforated lug transverse to the cylindrical inner surface. According to Alex Krieger (letter of August 12, 1944), this "looks like it might be from some of the effigy pottery in the northeastern Arkansas-St. Francis region; I'm pretty sure it is not from any place farther west or south." The four remaining sherds have a gray paste with fine white quartz inclusions, and "do not agree well with anything in the foci of the Caddo area" (Krieger, op. cit.); they are apparently unfamiliar to Southwesternists as well. I suspect that when fuller information is available for the region southeastward to the Mississippi and north of the Arkansas the source of these fragments may be determined. At any rate, it is safe, I think, to conclude that the Rice County Indians were in contact with more advanced pottery-making groups to the southeast as well as with the peoples of the upper Rio Grande; and that in this district, furthermore, the local types Geneseo Plain, Geneseo Simple Stamped, and Geneseo Red Filmed were approximately coeval with Mera's Group E and Kidder's Glaze IV wares. For the present, correlations with wares to the southeast are not feasible.

### *Clay Pipe Fragment*

In further support of the puebloan contacts indicated by the glaze-paint sherds, we may note the finding of an incised pottery pipe fragment in pit 2. The piece is about 30 mm. long, well fired and hard, with a smoothed outer surface; it was broken, apparently, from a straight pipe at the point where the 4-mm. stem bore expands abruptly into a bulblike bowl cavity. On the outer surface, directly opposite the stem-bowl juncture, are two narrow incised lines, 2 mm. apart, that encircled the pipe; above these, on the bowl exterior, are the ends of three straight longitudinal incisions 4 mm. apart, while just below the encircling lines, on the stem surface, is a girdling

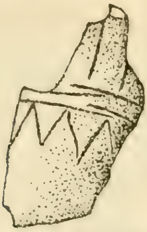

FIGURE 61.—Incised pottery pipe fragment (USNM 389132) from pit 2, Thompson site. Actual size.

zigzag incision (fig. 61). This is a puebloan type of pipe (cf. Kidder, 1932, figs. 138, *g*, 140); and its presence in a culture that evidently made stone pipes exclusively, and in close association with glaze-paint sherds, needs no further comment.

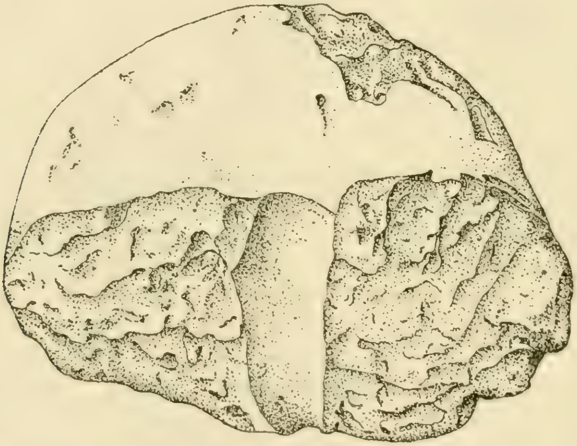

FIGURE 62.—Fragment of loaf-shaped baked clay object with central perforation, purpose unknown; from pit 1, Thompson site. Diameter 12 cm., thickness 7.5 cm. (USNM 389100.)

### WORK IN ANTLER

*Cylindrical objects.*—One fragmentary specimen, and possibly a second, is a curved cylindrical section cut from the shaft of a deer or elk antler. The cut ends have been rounded off, perhaps in rubbing or polishing; the sides have been rubbed down somewhat but without obliterating the natural surface rugosities. Length is indeterminate; diameter is between 30 and 40 mm.

*Eyed fragments.*—From mound 1 was taken a thin flat curved slip of antler measuring 45 by 6 by 2 mm. The edges and flat surfaces have been rubbed smooth; one end is cut square, the other is broken irregularly. Three millimeters from the cut end is a 2-mm. perforation, with some evidence of wear on the long axis of the implement. A similar but wider piece from pit 1 is 27 by 9 by 1.5 mm., with one cut and one broken end. About 3 mm. from the former is a 2-mm. perforation, slightly off-center. Both pieces suggest needle butts.

### OBJECTS OF BONE

*Bison scapula digging tools.*—There are approximately 25 specimens, most of them very fragmentary, identified as digging tools. Blade fragments are usually highly polished through use, and rather more than usual interest was shown in grinding down the scars left in removal of the scapular spine and other irregularities. A single specimen, from mound 1, retains the head of the bone, which has an irregular groove or broken-out socket for hafting on the dorsal surface. The ridges on the dorsal surface have been carefully ground down, and the deeply worn blade is well polished. It is 245 mm. long by 103 mm. wide. Other fragments show a broad rounded spadelike blade, but accurate measurements to show size range cannot be obtained from the available specimens.

*Awls.*—Seventeen awls include 6 of mammal leg bone and 11 of mammal rib or neural spine. Two of the former have the head partly worked down after splitting; they are 68 and 160 mm. long. The shorter specimen has two V's cut in one surface. A third specimen has the head completely removed; it is 110 mm. long. Three irregular splinter awls, 40 to 128 mm. long, complete the group.

In the second group, two are made from cut and shaped segments of rib face, with regular dressed edges, and one surface showing cancellous tissue; they are 63 and 115 mm. long. Two others are fashioned from face splinters; the edges are irregular, though somewhat worn from handling, and they are 110 and 115 mm. long. The remaining 7 specimens conform closely to the predominant type at Tobias; they are more or less triangular in cross section, with rounded butt, and usually have traces of cancellous tissue along one flat surface. Length varies from 52 to something over 80 mm. They were cut either from the edge of a rib or, more probably, from the anterior margin of the neural spine of the bison.

*Polishing* (?) *tools.*—This group includes 4 specimens with slightly flattened, faceted, or transversely striated points that are unlike the symmetrical polished awl tips. Two have the subtriangular cross section and rounded butt of the neural spine awls; they are 125–140 mm. long, and were found in pit 1. The other two are worked splinters of heavy leg bone, with flattened points that are transversely striated. They are comparable in length to the preceding specimens, but are somewhat thicker and less regular; both are from mound 1.

*Pointed split-rib implement.*—This is a thick, broad, tapered piece of split rib, evidently the external surface of the bone; it has been broken from some longer object. It is somewhat uncertainly identified with two heavy pointed objects from the Tobias site, in which the grip consists of unsplit, the point of split, rib (p. 256).

*Arrowshaft-straightener.*—A 120-mm. section of bison rib, tapering in width from 27 to 23 mm., has been broken at the narrow end through a hole 8 mm. in diameter. The remaining edge of the hole, on the external surface of the rib, has a polished wear facet.

*Scored implements.*—There are two of these. One, from pit 1A, is a 220-mm. length of rib with the vertebral extremity hacked away and the sternal extremity raggedly broken off. Beginning ca. 55 mm. from the vertebral end, the posterior margin of the external surface has 51 deep notches, averaging about 3 per centimeter. The first notch runs part way across the rib, as do the 25th to 29th, the 33d, and 34th; several others have faint striations extending out onto the rib face. This suggests that the edge notches, which show some evidence of wear, were intended as guides for spacing a full series of parallel transverse scorings (Wedel and Hill, 1942, pl. 12, *a*).

The second piece, from mound 1, is 75 mm. long, and is evidently from the narrow thick part of the rib shaft near the vertebral extremity. The external surface has 18 transverse grooves (average ca. 2 to 3 per cm.) of somewhat variable width and depth. At one point, both edges of the rib are lightly notched but the transverse connecting groove was never completed. The scored surface has been subjected to much wear.

*Worked rib, split.*—From mound 1 was taken a 165-mm. section of the internal surface of a split rib; one end is broken, the other rounded off, and the edges have been finished with some care. The cancellous surface has been rubbed down somewhat. Its use is not known, though it might have served for scraping or smoothing.

*Cancellous bone implements.*—There are two of these. From pit 1A was taken a thin oblong piece measuring 58 by 43 by 9 mm., with dressed edges, one of which has been thinned, and surfaces that have been ground or rubbed flat. From mound 1 came an ovate specimen with thinned, somewhat damaged edges, and rubbed surfaces; it is 75 by 60 by 10 mm. Neither shows any traces of pigment in the interstices, but their general appearance very strongly suggests the historic Plains type of paint applicator.

*Tubular beads.*—Eighteen of these objects, the only ones from the site made of bird bone, were found. The ends, where the articular extremities of the bone were detached, are smoothed, and the surfaces of the cylinders, often slightly curved, are polished from use and undecorated. They are 2.5 to 9 mm. in diameter, by 10 to 58 mm. long; width-length ratios vary from 1 : 2 to 1 : 15. In all respects, the beads resemble those at the Tobias site except that the 3 to 6 mm. by 12 to

25 mm. group, most common at Tobias, was not found at all at Thompson. Size analysis of the 16 complete specimens is shown in table 9.

TABLE 9

| Length<br>Diameter | 0-12 mm. | 12-25 mm. | 25-38 mm. | 38-51 mm. | 50-63 mm. (?) | Total |
|---|---|---|---|---|---|---|
| 0–3 mm | 2 | 3 | 1 | 1 | | 7 |
| 3–6 mm | 1 | | 1 | 2 | | 4 |
| 6–9 mm | 1 | 1 | 0 | 2 | 1 | 5 |
| Total | 4 | 4 | 2 | 5 | 1 | 16 |

*Miscellaneous objects.*—From mound 1 came a slender polished pinlike object 58 mm. long. From the broken-off tip it widens gradually toward a squared butt, which still retains part of the original head of the split bone. On one surface, near the butt, is incised a V, transverse to the long axis.

A flat lanceolate slip of bone, apparently broken from a scapula blade, has a broad rounded butt and a narrowed tip with polished edges. The entire margin is finished; one edge is lightly notched, and a shallow transverse cut extends nearly across one flat face. The piece measures 62 by 17 by 3 mm.; it may have been used for smoothing or scraping a yielding surface, as e. g., a pottery vessel.

The tip of a bison ulna, 125 mm. long, is rounded and use-polished; along the edge where the bone was detached, there is a broad worn concavity. The head has been hacked off. A smoothing implement is suggested.

Another piece of flat bone, with traces of cancellous tissue on one face, has a finished edge, and, on one thinned curving end there are 11 deep narrow closely set cuts. This suggests the notched flesher or graining tool of the historic Plains; but the present specimen differs from the usual type in being made of flat bone, perhaps a scapula fragment, instead of from the diagonally split metapodial bone of a cervid.

An 80-mm. section of mammal leg bone, splintered at one end, has been severed at the other end by sawing to a depth of 1 to 2 mm. and then snapping off. The break was ineptly made, and the rather ragged end has been somewhat smoothed off by rubbing or by wear. There is no indication as to use of the object.

### OBJECTS OF CHIPPED STONE

In shapes, techniques, and materials, the chipped stone artifacts from the site parallel those from the pits and mounds at Tobias. Our sample apparently includes somewhat less banded Florence flint from the Maple City, Kansas-Hardy, Okla., quarries, and alternatively a slightly higher incidence of obsidian. Of the latter material, present only as small flakes and one broken projectile point, seven pieces came from various levels in mound 1, five from the trench in mound 2, and four from pit 2. The occurrences in mound 2 and the underlying pit 2 are particularly noteworthy because of their proximity to the Rio Grande glaze-paint sherds and the incised pottery pipe fragment.

*Projectile points.*—These, totaling 72, are generally well made and symmetrical, but there is a slightly higher incidence of asymmetrical or unifacially chipped specimens, and no examples of the large notched and heavy-stemmed forms found in basins 1 and 2, mound 17, at Tobias. Small triangular unnotched points number 60, of which 39 are well made, usually bifacially and rather delicately retouched, with straight or very slightly concave base and convex or straight edges; length is 16 to 36 mm., width 9 to 18 mm., thickness 2 to 4 mm. Twenty-one other unnotched triangles are much inferior in workmanship, with asymmetrical cross section, inept retouching, irregular outline, and a longitudinal or transverse curve or twist; commonly, only one face has allover secondary chipping, with the other face retouched on the extreme edges.

Triangular notched points number 11; they are like the better-made specimens of the preceding group, except that each has a pair of lateral notches 2 to 5 mm. above the base. The base is usually very slightly concave, the edges straight or slightly convex. Length is 15 to 31 mm., width 10 to 15 mm.

There is a single stemmed point. It has a short broad thick blade, shoulders, and an expanding stem with convex base. It measures 26 by 19 by 5 mm.

*Drills.*—There are 26 complete and fragmentary objects classed as drills. Eleven of these, including 9 fragments, are regarded as plain shafted forms, the fragments because of their general similarity in shape, dimensions, and cross section to the more numerous whole specimens from the Tobias site. Subgroups include large heavy unstemmed drills; large heavy stemmed drills; and medium to small unstemmed drills. Large heavy forms include 2 whole and 5 broken pieces; the former are 63 by 12 by 6 mm. and 51 by 8 by 6 mm., with the fragments of comparable width and thickness. They have the maximum width at the middle, a biconvex or rhomboidal cross section, rounded or squared ends, and in all cases, blunted edges and tips. The large heavy stemmed specimens, two in number, are similar, with measurements of 73+ by 9 by 7 mm. and 50 by 12 by 7 mm.; each has a thin short stem 10 to 13 mm. long at one end. Medium to small unstemmed drills are smaller-scale duplicates of the first subgroup; the one whole example measures 38 by 5 by 4.5 mm. and there is a short section of shaft of comparable width and thickness.

Twelve other specimens have the shaft widened at the base. One, 33 mm. long, widens gradually from 5 mm. at the broken tip to 12 mm. at the butt. Ten have slender shafts 10 to 30 mm. long, widening abruptly to a large irregular flange, usually with unretouched edges, at the base; they vary from about 30 to 74 mm. in length. They are generally lighter and more delicate than the rodlike plain shafted forms, and the edges lack the extreme blunting of the latter. There is a single specimen in which the rodlike shaft widens abruptly to a small flange; it is T-shaped, 266 mm. long and 15 mm. across the base.

Uncommon forms include 3 drills that have been fashioned apparently from reworked projectile points. Each has a straight or slightly concave base 12 to 14 mm. wide; 4 to 10 mm. above the base, the edges of the blade have been chipped back to form a narrow tapered point that is, however, broader and more obtuse than the tips of the usual drills. They may represent a specialized type of projectile point, but I suspect they were used for boring holes in thin pieces of bone, horn, wood, etc.

*Knives with beveled edges.*—Five of these are nearly complete enough to indicate their general resemblance to specimens from Tobias. The base is short and tapered or convex, with ground edges; maximum width is at or just above a pair of broad lateral notches, whence the blade, with oppositely beveled edges, narrows at first rapidly and then more slowly to the tip. The blade has a rhomboidal cross section; and when held tip upward the left edge bevel is visible. This holds for all beveled fragments from the site. Length varies from ca. 75 to 104 mm., width from 26 to 30 mm.

In addition to the above, there are 16 other slender beveled and tapered fragments that are presumably from similar objects. They range in width up to a trifle over 45 mm., but only 3 exceed 30 mm. One suggests the 4-edged "Harahey" form, but the fragment is inconclusive. With one exception, none has the blade edges blunted or ground.

*Knives with unbeveled edges.*—These are surprisingly scarce in our collections; they are represented by 4 or 5 fragments of brown jasper with thin sharp edges worked about equally from both surfaces. Two nearly complete specimens have one surface chipped almost flat, with the final retouching and sharpening done entirely on the convex face. One (fig. 63, *a*) is slightly curved, with both ends pointed, and measures 155 by 35 by 12 mm.; the other is subtriangular, apparently retouched after fracture, and measures 135 by 44 by 13 mm.

*End scrapers.*—These are the usual Plains type of plano-convex implement, subtriangular to subelliptic in outline, with a thick, broad,

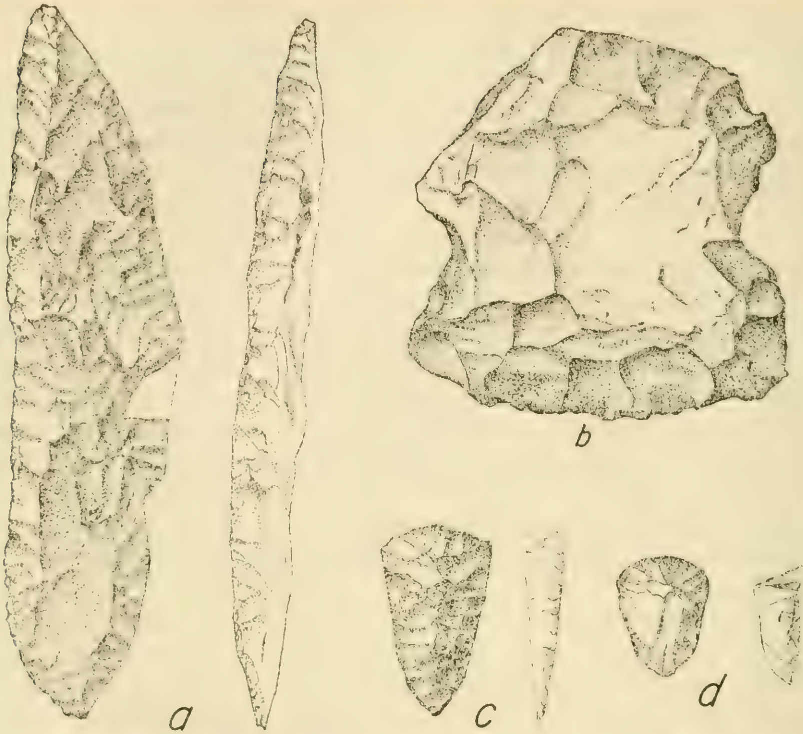

FIGURE 63.—*a*, Chipped knife; *b*, notched ax; *c*, *d*, end scrapers. All from Thompson site.

rounded, steeply chipped working end, whence the specimens taper to a pointed or acutely rounded tail. They vary from high-backed to ridged to low flat-backed forms. The great majority have the long edges rubbed or ground down, whereas the rounded working ends are usually sharp and unblunted. The material is highly varied, but includes relatively little banded fossiliferous stone. The extreme range in size is from 20 by 16 by 5 mm. to 63 by 39 by 11 mm., which lies within the limits of scraper sizes at Tobias. On the basis of length, the 159 specimens include 84 (52.8 percent) under 30 mm., and 133 (83.6 percent) under 38 mm., both percentages exceeding the corresponding figures for the Tobias site and thus indicating a somewhat smaller average size for the Thompson end scrapers (fig. 63, *c*, *d*).

*Side scrapers.*—This rather vaguely defined group includes a hundred or more spalls and flakes of varying size and shape, showing on one side a broad unretouched curved or twisted cleavage plane and on the other side retouching along one or more edges. Small thin prismatic flakes usually have two long edges retouched, and should perhaps be termed flake knives. Heavier specimens, many of which tend toward a subtriangular outline generally have only one edge retouched. As a group, they show far less effort at shaping than do the end scrapers; but for scraping or cutting they would seem to have been equally serviceable.

*Axes.*—There are five of these thick chert or jasper objects. They are roughly chipped to oblong or subquadrilateral form, with a pair of broad shallow blunted notches. Most show traces of a calcareous matrix on the central portion of one or both faces, indicating that the stone was quarried from thin seams. One or both blades are usually battered. They are 66 to 88 mm. long, 68 to 83 mm. wide, and 22 to 37 mm. thick (fig. 63, *b*).

### OBJECTS OF GROUND AND PECKED STONE; PIGMENTS

*Grooved mauls.*—Three of these were found. From pit 2 came a well-made cylindrical specimen of pink Sioux quartzite with flattened circular striking surfaces and a well-defined encircling groove. It is virtually identical with the three Group 1 mauls from the mound 17 complex at Tobias (p. 276), measures 100 mm. long by 71 mm. in greatest diameter, and weighs 22 ounces. The same pit yielded a larger and cruder subcylindrical gray quartzite maul with rounded polls, which is analogous to the Group II specimen at Tobias; it measures 121 by 96 by 80 mm. and weighs 59 ounces. The third maul, from mound 1, is also roughly shaped and asymmetrical, with lateral flattening, and some spalling of the polls, apparently from hard usage. It is of Dakota sandstone, measures 132 by 92 by 84 mm., and weighs 42 ounces.

*Manos.*—While our limited excavations yielded no mealing slabs, their use at the site may be inferred from the finding of three complete and four fragmentary manos; five of the specimens are from mound 1, two are from pit 2. All show a single grinding surface. Of the complete specimens, two are of elongate-elliptic outline with rounded ends and planoconvex cross section; the third is subrectangular with rounded corners. They are 180 to 217 mm. long, 84 to 96 mm. wide, and 43 to 76 mm. thick. Of the four broken specimens, one suggests the first form, two the second. Four of the specimens are of sandstone, three of quartzite.

*Discoidal rubbing stone.*—This is of fine-grained quartzite, circular in outline, with two subparallel flattened smooth surfaces, and slightly convex sides that have been pecked or battered to shape but not smoothed. The flattened areas are 85 and 60 mm. in diameter; the overall measurements are 95 by 44 mm. Udden (1900, p. 64 and fig. 29) reports apparently similar forms from the Paint Creek site, designating them as "throwing-stones?".

*Shaft smoothers.*—Five whole specimens and 38 fragments from all parts of the excavations attest the abundance of these implements, undoubtedly used in pairs. The upper longitudinally grooved surface is usually flat; the base, sides, and ends may be flat and straight, giving a rectanguloid block, or as often convexly curved and rounded or somewhat tapered. Occasional pieces have two opposite sides grooved. All are of Dakota sandstone with excellent abrading qualities. The whole specimens are rather small, 42 to 80 mm. long, 21 to 30 mm. wide, and 12 to 25 mm. thick. Among the fragments is one, otherwise finished, with a narrow ridge running down the midline of the rubbing surface where others have a groove. This, I believe, is the scar left when the original block from which a pair of smoothers was to be made, was partially sawed through and then split (p. 338). The next step would have been removal of the ridge and preparation of the groove. The grooves on the fragments are varying depth, width, and character; some are concave in longitudinal profile or terminate short of the end of the stone, and were probably used as sharpening blocks.

*Rubbing stones.*—Here are included two or three irregular flat pieces of sandstone with two smoothed but ungrooved surfaces; they seem to have been used in rubbing or polishing. A third piece, transversely broken, has deeply worn broad grooves on the upper surface and slightly raised flanges, like a miniature metate; it measures 84 mm. wide, 35 mm. thick, and 74+ mm. long. Its use is unknown.

There are, in addition, five lumps of fine-grained, rather dense, reddish sandstone with facets from rubbing. These were at first thought to be pigment blocks, and they do give a good red-brown streak. However, their fine gritty texture suggests a possible use for rubbing. The largest piece has a broad curved smooth face 40 by 65 mm., whose curvature fits nicely the exterior of many sherds and of some of the large pots from the nearby Tobias site. The other pieces are smaller, each with a flat or slightly curved surface, but all can be held conveniently in the hand. Possibly they were used to give the final surface smoothing to the complete but unfired pottery vessels.

*Pipes.*—Of these, only fragments were found. From pit 1A came the half of an L-shaped catlinite pipe that had been split longitudinally through bowl and stem. It is 43 mm. high, 25 mm. long, and the walls of the bowl are slightly convex; there is no incising, beading, or other decoration. It is of particular interest because the cavity in the long arm is heavily "caked" with carbon, thus demonstrating beyond any question that the long arm was the bowl and not the stem, as has been implied in several published accounts. Its similarity to the Tobias site specimens is obvious. Five other small, thin, plain, transversely curved bits of catlinite, two of them smoke blackened on the concave surface, strongly suggest pipe bowl fragments.

From mound 1 came a fragment of thick-walled catlinite tube, undecorated and not fire blackened. It is appreciably heavier than the usual L-shaped pipe bowls, but is reminiscent of the straight tubular pipes (p. 287) of the locality.

Mention has been made elsewhere of the incised puebloid pipe fragment from pit 2. There was no evidence whatever of locally made pipes of material other than stone.

*Pigments.*—From pit 1A was taken an irregular fragment broken out of what appears to have been a hand-molded "ball" of fine-grained, soft, friable, porous clay with high iron content. It leaves a bright red-brown streak on the finger. At one side, and partly broken away, is a smooth-sided cylindrical hole 5 mm. in diameter that passes through the piece; from this hole to the convex molded surface the radius varies between 15 and 30 mm., suggesting a more or less oblong cake of unknown size and thickness.

Pit 4 yielded two small irregular and unshaped bits of limonite 16 and 25 mm. in greatest dimension; they are friable, give a red or red-brown streak, and have striated wear facets. They contain little or no silicious matter, and are in all probability paint material.

### OBJECTS OF EUROPEAN MANUFACTURE

On the basis of our limited finds of iron, copper, and glass at the Tobias site, and in view of the obvious close relationship between the Tobias and Thompson sites, it was expected that some similar evidence of European contact, either direct or indirect, might show up at the latter station. This expectation was realized in the work on mound 1 and in pit 4, at the west edge of the mound. There was no glass or copper, but in the clearly undisturbed central part of the mound, at depths ranging from 7 to 16 inches, were found three small complete and fragmentary rings of heavily oxidized iron, and a mass of similarly oxidized, apparently interlocking, rings was unearthed in pit 4, at a depth of 30 inches. The provenience of every one of these finds was carefully noted;[29] there was no evidence whatever of any recent disturbance of the surrounding and overlying soil formations, and so the inclusive nature of the iron and its contemporaneity with the directly associated aboriginal remains cannot be questioned.

Because of the advanced stage of oxidation, the original metal is believed to have been entirely replaced, so that the form only of the rings is retained, and the heavy incrustation makes close study exceedingly difficult (pl. 50). The rings, however, appear to have been circular rather than elliptical; they have an outside diameter of ca. 10 mm., and inside diameter of 7 to 8 mm. The mass from pit 4, though too small and incrusted for a positive reconstruction, was apparently a rather simple loose fabric in which each ring interlocked with four adjacent rings of similar size. This specimen was submitted to Stephen V. Grancsay, of the Department of Arms and

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[29] Through a regrettable oversight, these specimens were erroneously attributed to the Tobias site in my preliminary report (Wedel, 1942, p. 7).

Armor, Metropolitan Museum of Art, who states (letter of Dec. 18, 1940) that "There is no doubt in my mind that the fragments are of chain mail. The ring diameter of mail of the 16th century varies considerably, from ⅛ inch more or less to ½ inch more or less. . . ."

So far as I am aware, chain mail has been reported from but one other village site in the Central Plains, viz, the Paint Creek site about 25 miles east of and culturally very similar to, the Thompson site (Udden, 1900, frontispiece and p. 66). This specimen, now unfortunately lost, was dug out of a refuse mound at a depth of 6 inches underground in Udden's presence, and there is no reason whatever to doubt its authenticity. According to Udden, "it measured about 2 inches square and the size of the oval rings was a little less than one-half inch in length. The metal had suffered much from oxidation and the spaces between the rings were filled with rust so thick that the whole specimen was almost a solid mass. . . ." The illustration suggests that structural details of the fabric were better preserved than in our specimen, but the text gives no information on this point.

That the chain mail fragments from Paint Creek and those from the Thompson site reached central Kansas from the southwest and are ultimately of Spanish origin is, I think, a reasonable inference. That they are relics of the Coronado entrada of 1541, as Udden suggested from his find, is also possible, but cannot be conclusively demonstrated. In Europe the use of chain mail seems to have declined after the 12th century (Dean, 1930, p. 50), but apparently as late as the 16th or 17th century it was still employed extensively as supplementary protection for the elbows, armpits, and groin (Dean, op. cit.; T. Hoopes, letter of June 10, 1941). The Coronado muster roll (Aiton, 1939) and the list of equipment requisitioned by Oñate (Hackett, 1923, p. 229) both contain references to "cueras de malla" or "cotas de malla," i. e., coats of mail. There appears to be some question whether these garments were actually of chain or plate (Curtis, 1927, p. 109), though Aiton (letter of January 4, 1941) says "I am certain that the *cueras* and *cotas de malla* in the Coronado accounts refer to link or chain mail and not to overlapping plates or scales." It appears, in short, that the chain mail fragments under consideration are not, by themselves, sufficiently definitive to justify a chronological estimate for the deposits in which they lay.[30] For the 16th or early 17th century allocation of the Thompson site specimens, however, we have the strong confirmatory evidence of datable glaze-paint sherds from mound 2 and pit 2. We shall return to this point in another section.

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[30] A somewhat more extended discussion of this matter can be found in my preliminary paper (Wedel, 1942, pp. 7–8). Bolton (1949, p. 293) expressed the "strong probability" that our chain mail fragments and that reported by Udden were relics of the Coronado expedition of 1541.

### OTHER SITES (HAYES, MAJOR)

Two miles southeast of the Tobias site, on a commanding hill a few hundred yards south of Little Arkansas River, is the Hayes site (14RC3). It occupies the summit of a broad ridge whence the ground slopes north to the river bottoms, as well as eastward and southward to a small apparently nameless creek. On the highest point, visible from the Tobias site, is a well-defined "council circle" about 40 yards in diameter. Its center is mounded to a height of about 2 feet; encircling this elevation is a continuous ditch 12 to 18 inches deep and 12 to 15 feet wide. On my first visit, in early June, the corn in the ditch stood nearly 18 inches high, whereas that elsewhere on the site was less than 6 inches. We made no tests in or about this circle, but were informed that some years previously local individuals had found ashes to, or at a depth of, about 3 feet at the mound center. Mr. Horace Jones informs me (letter of Oct. 9, 1945) that human teeth were also found in this work, and that a very large notched triangular point, like those we recovered in basin 1, mound 17, at Tobias, was picked up on the "council circle." To the west, southwest, and east of the circle considerable debris was to be seen in 1940 on the cultivated surface, and this seemed to be more or less localized in spots. Mounds, if they were ever present, have apparently been reduced by tillage, and there is, of course, no surface indication of cache pits. A gully heads near the circle and runs south to the unnamed spring branch; it is flanked by two sloping partly grassed ridges that would provide ample room for a village community at least as large as those at Thompson and Tobias. About 450 yards south of the circle, near the mouth of the gully, is a sandstone outcrop bearing a few simple pictographs and overlooking a fine spring. This spring undoubtedly furnished the domestic water supply for the former inhabitants of the site immediately to the north and around the "council circle."

The artifacts we picked up on the surface, though few in number, indicate close relationship to the Tobias and Thompson sites. Eighty-four body sherds include 65 of Geneseo Plain, 7 of Geneseo Simple Stamped, 8 of Geneseo Red Filmed, 3 of cord-roughened grayware, and 1 plain hole (shell)-tempered. Six small rimsherds, all with plain surface, include two with plain rounded lip; two with rounded lip crossed by diagonal incisions; one with thickened lip; and one with heavy everted lip, vertically incised on the inner upper lip. Stonework included six base fragments of small unnotched triangular points, several end scrapers, a broken drill with large abruptly widened flange, a beveled blade fragment, and miscellaneous other chipped and retouched pieces. A bun-shaped sandstone discoidal, with squared sides, is 79 by 44 mm. A longitudinally grooved sandstone abrader fragment has secondary grooves on two sides. A small bit of pink Sioux quartzite, evidently from a cylindrical flat-ended object shaped by hammer pecking looks like a spall from the poll of a well-made grooved maul. Another spall of greenish (Spanish Diggings?) quartzite has faint suggestions of a shallow groove, and may be from another maul. The fine catlinite pipe shown in plate 45, *f*, now in the Lowell Peverley collection, Geneseo, Kans., is said to have been found not far west of the pictograph bluff; it measures 66 mm. long by 42 mm. high, with 4 notches cut into the projecting prowlike stem, and zoomorphic designs incised on the bowl and both sides of the stem. Unhappily it cannot be allocated with certainty to the site or horizon under consideration, and there is a possibility that it dates from a later period.

Half a mile or a little more to the northeast, where another short unnamed creek flows into the Little Arkansas from the north, is the Major site (14RC2). This was mostly in wheat during our 1940 investigations, and I am unable to state the extent of the area of occupation. When I first saw it some 12 or 15 years earlier, it was still partly in sod, with shallow depressions scattered over perhaps 5 or 6 acres along the top and side of a broad gently sloping ridge. Along the west side, where the Atchison, Topeka, and Santa Fe railroad grade cuts the hillside, several cache pits had been sectioned. Mounds, if present, were comparatively insignificant, and so far as I know a "council-circle" has not been reported here. The location is plainly visible from the Hayes site.

Sherds from the Major site include 47 of Geneseo Plain and 5 of Geneseo Simple Stamped. Six rimsherds with plain exterior included four with plain rounded lip, one with plain flattened lip, and one flattened diagonally incised lip. There were, in addition, 43 body sherds with fugitive red paint on exterior, interior, or both surfaces; 38 had a plain exterior, 3 bore simple stamping, and 2 were faintly cord-roughened. Three redware rims had plain rounded lips, and one had a small nipplelike protuberance about 10 mm. below the lip on the exterior. Three plain shell-tempered sherds and the midsection of a thick shell-tempered loop handle with a single row of punctations down the midline completed our sherd sample. The very high incidence of redware, probably Geneseo Red Filmed, as compared with Tobias, Thompson, and Malone, is noteworthy, but at the moment cannot be explained. Stonework includes two end scrapers, several broken side scrapers, a slender symmetrical tip of beveled blade, two unnotched triangular points, and one large heavy brown chert blade with convex base and shallow side notches, somewhat reminiscent of the heavy stemmed blades from basin 2, mound 17, at Tobias.

Despite the inadequacy of our surface collections and the lack of controlled excavation at the Hayes and Major sites, there seems to be no reasonable doubt that they are affiliated culturally with one another and with the much more fully known Tobias and Thompson sites. That all four of these belong to the same general time period is also probable, though it obviously cannot now be asserted that all were occupied at exactly the same time or alternatively that any particular one was earlier or later than the others. I would expect that the accumulation of large, systematically excavated artifact series from the Hayes and Major sites might well show variation in the frequency of occurrence of certain wares or other artifact types or styles, as compared with material from other sites, and that through such variations the several stations might be arranged in a tentative sequence. For the present, however, we shall probably have to be content with the broader allocation, on a tentative basis, of all four sites to the same general cultural and time period.[31]

## SITE ON COW CREEK, RICE COUNTY

### MALONE SITE (14RC5)

Cow Creek is a small perennial stream which rises in eastern Barton County and, with its tributaries from the north, drains most of Rice County. It follows a southeasterly course, parallel to that of the Little Arkansas, and joins the Arkansas River at Hutchinson. In its upper portion, the creek flows in a narrow trench 15 to 20 feet deep, with a wide shallow valley. The high well-marked bluffs, sandstone ledges, and hills characterizing the Little Arkansas valley are absent from Cow Creek. A few miles southwest of Lyons, the creek leaves the Tertiary uplands to enter the broad low-lying alluvial plain of the Arkansas. It skirts the east edge of this plain, at a distance from the Arkansas not exceeding 10 or 12 miles, for nearly 50 miles before emptying into the main river. Here the creek banks are low and subject to frequent inundation,[32] and a strip of sandhills separates Cow Creek from the valley of the Little Arkansas.

No systematic and comprehensive archeological survey of Cow Creek valley has yet been made. A preliminary plat of known artifact-bearing localities in Rice County, furnished me by Horace Jones, includes numerous stations on the main stream and most of its tributaries, except Little Cow Creek, above the town of Saxman. Below that point, on the alluvial plain, village sites appear to be less common, and it has not been determined that there was any extended occupancy by semisedentary corn-growing Indians.

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[31] In 1948 a field party from the University of Kansas Museum of Natural History reexamined the Hayes and Major sites, and conducted brief test excavations in two mounds at the latter. A surface collection from the Hayes site is reported to include a sherd of "Rio Grande glazed ware, Late Glaze E or F, dating from the seventeenth century." Mound tests at the Major site yielded interesting clues to the ceramic history of the locality (Smith, 1949 a, pp. 294–295).

[32] Captain Bell, heading a detachment from Maj. S. H. Long's exploring expedition, descended the Arkansas on its left bank in 1820. On August 13, this party "crossed a creek [Cow Creek] which is destitute of timber as far as the eye can trace its course . . . about a mile above its confluence . . . [This creek was] knee-deep, flowing with a moderate current over a bed of sand and gravel, the surface of the water being depressed only about four feet below the general level.—" Here the party killed an elk, and observed that "bison are yet numerous, and the white wolves also abundant" (James, 1823, vol. 2, p. 212).

Our investigations on Cow Creek were limited to a week of digging on the Malone farm, 4 miles due west of Lyons and just south of the present crossing of U. S. Highway 50. The heaviest concentration of archeological materials at present appears to be in an area of perhaps 15 or 20 acres, on the edge of the flat uplands some 400 yards or more east of the creek, and extending southward from the highway for a quarter or half mile. Local collectors say that sherds and other remains have been found for nearly a mile more toward the southeast, but much of this is rather sparse and may indicate only sporadic occupations or temporary outposts of the main community.

The locality is of historic as well as archeologic interest. Just south of the Malone site is the Cow Creek crossing of the old Santa Fe wagon trail, still marked by deep ruts on either bank of the stream.[33] Nearby, on the east bank, is a slab-lined well known as "Buffalo Bill's well," allegedly walled at the bottom with a 20-gallon whiskey barrel. During the 1860's a fort with barracks, blacksmith shop, and other installations guarded the crossing, and at a later period a trading post owned and operated by the famed William Matthewson stood on the west bank. Noted plainsmen, Indian chiefs, army officers, and others traveled through this station at one time or another; and about the post and the earlier fort took place many a skirmish between the white soldiers and freighters and the Kiowa, Comanche, Cheyenne, Arapaho, and Dakota from the still untamed Plains to the west. Relics from these picturesque trail days are still turned up from time to time by the plow in the fields surrounding the crossing.

The remains presently to be described from the Malone site clearly date from a much earlier period. They were first reported, apparently in a paper read in 1873 before the Kansas Academy of Science at Lawrence, by Mudge (1896, p. 70), first State geologist of Kansas. His observation is brief:

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[33] Joseph C. Brown of the U. S. Surveying Expedition, observed in 1825 that "Cold Water or Cow Creek is a narrow stream from 30 to 50 links (20 to 35 feet) wide, for the most part miry, banks commonly high. There is a tolerable crossing just above the largest body of timber on it, which is very conspicuous; on the two branches eastward of the creek is timber. The camping is good on this creek for wood, grass, and, commonly, buffalo. . . . On Cow Creek or Cold Water, short grass commences, and the short grass bounds the burnings of the prairie. This creek is almost as nigh home as the buffalo are found, and from this creek they may be had at almost any place until within sight of the mountains near Santa Fe" (cited by H. Jones, 1928, pp. 55–56).

> About half a mile from the crossing of the old Santa Fe trail at Cow Creek, in Rice County, are seen the remains of pottery, etc., showing that at least a temporary village formerly existed at that spot. The area covered is small, and the pottery very fragmentary.

A few years after this note was published, the indefatigable Brower (1899, p. 85) again noted the site at the Cow Creek crossing, figured a mealing stone, muller, and grooved maul from it, and remarked that—

> At that locality on both sides of the trail at a handsome and sightly terrace on the east side of the creek is the site of a prehistoric village which has been named the Mudge site, after the late Prof. B. F. Mudge.
>
> There primitive man maintained a permanent encampment in a fruitful region slightly fringed with timber, on either side of Cow Creek, which carries but a small volume of water. Metates, grooved hammers, spear-heads, arrowpoints, drills, catlinite pipes, and clay vessels were used in ancient times at this site.

Following Brower, the site seems to have slipped once more into oblivion until about 1927. Then came a local recrudescence of interest that led to considerable digging in this and other Rice County sites, and finally to the belief that the villages here located were a part of the province of Quivira visited by Coronado in 1541 (Jones, P., 1929, 1937). We shall revert to this matter again.

Brower describes the terrace as handsome and sightly, and in its original grassland state it undoubtedly was so. During our brief sojourn, in early June, the deeply grassed bottom lands were besprinkled with a profusion of wild flowers, including anemone, Mexican poppy, sun-drops, Venus looking glass, wild lupines, and others. On the creek banks stood ash, elm, and cottonwood, with a scattering of Osage orange and mulberry, and thickets of wild plum, grapes, and elderberry. Of wild mammals only a few rodents and other small fur bearers are left, but there is a varied and abundant avifauna. The locality is an interesting one, and environmentally contrasts most pleasingly with the increasingly dry and treeless region to the west.

The Malone site in 1940 was almost wholly under cultivation, and rigid restrictions were placed on our exploratory activities. It was impossible to make a thorough surface survey or to test freely for the most likely refuse areas. A lane running due west from the owner's farmyard opened into a pasture, and here, at the edge of the upland terrace, was a 2- or 3-acre tract of unbroken sod with definite indications of former aboriginal habitation. Numerous small weedy depressions were visible, seemingly occurring in clusters of 3 or 4, and these in turn in larger groupings of 10 or 12. On the terrace rim, overlooking the quarter-mile-wide east bottoms of Cow Creek, were two low mounds perhaps 10 yards apart, not more than 30 or 40 feet across, and 12 to

18 inches high. Nearby, were two shallow basins 15 to 24 feet across by 6 or 8 inches deep, suggesting by their size the possibility of lodge sites. Permission to test one or both of these basins was refused. In conformity with the owner's stipulations, we further restricted our work to the opening of two cache pits in the pasture and the clearing of a 3 by 35-foot trench just outside the fence at the edge of a wheatfield. These features all lay between 70 and 120 yards south of the point where the lane enters the pasture and within 25 yards of the east fence line (fig. 64).

### CACHE PITS

Cache pit No. 1 was 57 inches in diameter at the mouth, 108 inches in greatest diameter at the floor, and 80 inches deep. In profile, it showed a nearly cylindrical neck to a depth of 39 inches, below which the walls curved out and down. The fill was a very dark brown, mixed with pockets of ashes, lumps of charcoal, burnt earth, and trash, which contrasted sharply with the red-brown surrounding clay. Here and there on the walls, where the fill caved off readily, the tool marks of the bone hoes used in the original excavation could be seen. The upper 3 feet had been much disturbed by the activities of badgers or other burrowing animals, through whose tunnels several bits of modern iron and fresh chicken bones had been introduced. Native materials included unfinished, broken, and a few complete scapula hoes, shaft smoothers, potsherds, small chert and bone artifacts, and numerous small unworked sandstone boulders.

Cache pit No. 2, some 60 yards north of the preceding, showed considerable evidence of random digging and rodent burrowing in its upper 24 inches, with such clearly intrusive items as a battered tin pail and a fruit jar lid present. It measured 78 inches across the mouth, 102 inches across the grass-lined floor, and 60 inches deep. Nearly a third of the floor area had been cut away in the excavation of a later pit immediately to the north. This, No. 2A, was 48 inches wide at the mouth, 87 inches across the bottom, and 72 inches deep. The walls had been carefully smoothed and apparently lined with grass. Both pits contained dark soil mixed with ash pockets and charcoal, in which were quantities of bison and turtle bones, sandstone fragments, and discarded artifacts.

The test trench, on the whole, was disappointing. The uppermost 3 to 6 inches of what we had hoped might be a midden, was fine light-gray soil, either wind blown or plow turned, and contained almost no admixture other than worked flint. From 6 to nearly 12 inches the soil was darker, mixed with broken animal bones, mussel shell fragments, charcoal, potsherds, flint chips, and miscellaneous small and fragmentary artifacts. This stratum may represent the original topsoil prior to modern farming activities and recent dust storms. Cul-

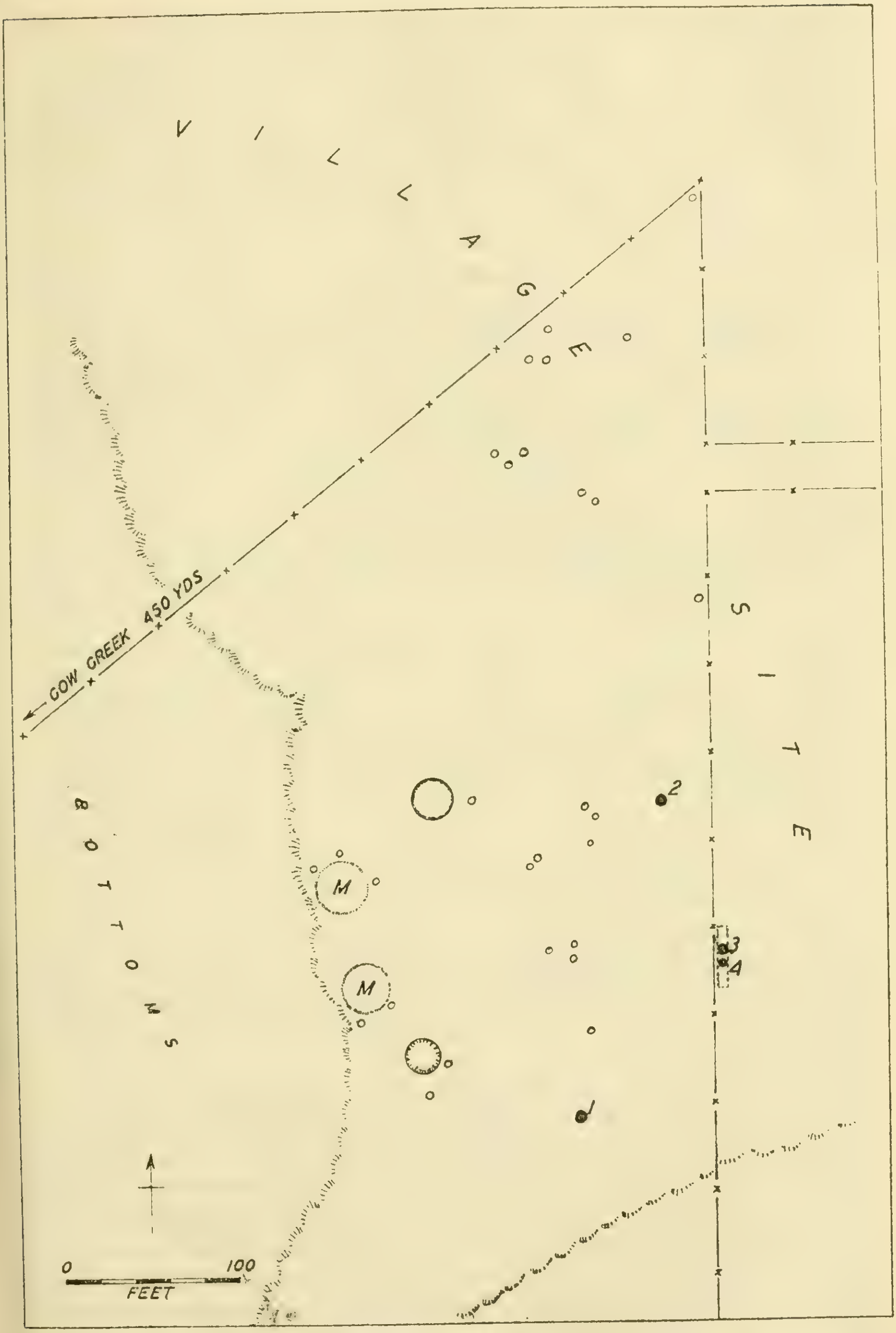
VILLAGE SITE
COW CREEK 450 YDS
BOTTOMS
M
M
2
3
4
1
0
100
FEET

FIGURE 64.—Sketch map of part of Malone site, 14RC5. *M*, refuse mounds; *1–4*, excavated cache pits; small circles, unexcavated caches(?); large circles with rayed rims mark possible house depressions.

tural admixture faded out below 12 inches at the south end of the trench, and below 15 or 18 inches at the north end. Where debris occurred to greater depths in the central part of the cut, its presence was found to be due to trash-filled pits. It is from these pits that most of our specimens came. I suspect that the very slight ground-surface elevation at this spot resulted from the continued dumping of refuse and floor-sweepings into and on old caches until the waste overflowed to form a low mound.

Two large cache pits and a smaller ash-floored basin were exposed in the trench. The caches No. 3 and No. 4 lay close together, so close in fact, that caving of the soil between partially obscured their original form. Neither was clearly traceable above the buried dark humus stratum, which inferentially represents the level from which they were originally dug. The larger pit, No. 3, seems to have had a mouth about 42 inches across, a floor 87 inches in diameter, and a depth from present ground surface of 72 inches. Judging from the comparatively unbroken north wall, it seems to have had a nearly cylindrical neck to a depth of 28 inches, below which point the walls flared sharply outward. The upper 42 inches were alternate hard and soft ashy soil, at which level a 12-inch bed of nearly pure white ash occurred. This was sifted, yielding such items as corn, cobs, beans, plum pits, mussel shells, grooved mauls, tubular bone beads, flint drills and arrowpoints, end scrapers, and a fragment of a large heavy metate. Below the ash was hard earth with numerous ash-filled burrows and pockets of ash. Against the cache wall lay numerous articulated vertebrae and other disconnected bones of bison. Numerous scapula hoes, an unfinished pair of abrading stones, a maul, flint knives, and numerous sherds occurred through the lower part of the fill. The floor was covered with a layer of burnt grass.

Cache pit No. 4 was 38 inches across the opening, 50 inches deep, and had a floor diameter of 64 inches. The upper portions of the walls were badly caved off, but the fill was heavily mixed with ash, charcoal, broken bison bones, sandstone fragments, and sherds. Charred joint-grass covered the floor.

Seven or eight feet north of pit No. 3 a much smaller structure extended as a semicircular disturbed area, halfway across our test trench. The trench wall showed that this was another dug pit with the walls converging slightly toward the top. The fill was moderately mixed with ash and refuse. The bottom of this pit, 25 inches underground, had been baked hard by fire to a depth of about 1 inch, and was covered by 4 inches of fine white ash. Diameter of the floor was about 48 inches; of the top, 30 inches. Whether this was a small storage receptacle, an oven or roasting pit, or something else altogether, I am unable to say.

So far as our investigations go, it appears that the slight elevations and the caches on the Malone site do not differ significantly from those at the Tobias and Thompson sites on Little Arkansas River. Long cultivation has probably destroyed a number of former mounds in the fields north and east of the pasture corner where we dug, though their approximate location could doubtless still be determined by repeated surface examinations at the proper time of year. During our stay, plowing just north of the pasture revealed the presence of literally scores of trash-filled pits and I have no doubt that these occur by the hundreds on the site. My chief regret is that we were not permitted to examine the basins faintly visible in the pasture; their size seems too great for caches, and may indicate the presence of shallow habitation structures with slightly depressed floors. They suggest, at any rate, that future work in the Rice County village sites, particularly where the surface has not been long or deeply tilled, might well be directed to a close search for traces of dwellings. I have no illusions regarding the difficulties and possible disappointments of such a search, but until it has been done successfully we must continue to speculate as to the nature of the houses in which the vanished inhabitants of the villages lived.

### FOOD REMAINS

*Vegetal remains.*—Maize was present as charred kernels scattered through the fill of nearly all the pits, and to a lesser extent in the mound test. From pit 3 came several small cobs, 9 to 13 mm. in diameter and up to 45 mm. long, apparently 10 rowed. The stray kernels noted seemed to be short, wide, and fat. There were a few fragments of the ear stalk in the pit.

Beans were indicated by one specimen, also from pit 3; it measured about 9 by 5 by 3 mm.

*Mammalian remains.*—As might have been expected from our very limited excavations at the Malone site, relatively few animal bones were turned up. They represented the following forms, listed in order of abundance of identifiable bones recovered:

| | |
|---|---|
| Bison (*Bison bison*) | 18 |
| Dog (*Canis familiaris*) | 13 |
| White-tailed deer (*Odocoileus virginianus*) | 8 |
| Raccoon (*Procyon lotor*) | 1 |
| Kangaroo rat (*Dipodomys ordii richardsoni*) | 1 |
| Pocket gopher (*Geomys bursarius*) | 1 |

It may be of interest to note that the single raccoon bone listed here is a humerus found in pit 2A and measuring 117 mm. in length. This, I am told, exceeds in size any other raccoon humerus in the national collections, where it is now preserved.

*Other vertebrate remains.*—Two bones of the terrapin (*Terrapene*) were found in pit 3. There were no bones of birds or of fishes.

### POTTERY

For the Malone site, there are available no whole or restored pottery vessels, and for purposes of description and comparison we must rely entirely on a series of 1,056 sherds, of which 942 are body fragments, 102 are rim pieces, 10 are detached handles or handle fragments, and 2 are flat disk base fragments. Table 10 summarizes the provenience of this material, and indicates the relative abundance and distribution of wares and other significant pottery features within the site.

Of the total sherd series, 972 specimens (92 percent), including all rims and handles, can be broadly classed as sand-tempered graywares; and of these the body sherds, on the basis of surface treatment, can be further divided into the same wares found at Tobias and Thompson, viz, Geneseo Plain and Geneseo Simple Stamped. As between these two, it is impossible to allocate the rims and handles, and they will therefore be separately considered. Of the body sherds, 55.7 percent are Geneseo Plain, a sharp drop from the corresponding figures for Tobias and Thompson; and 35.5 percent are Geneseo Simple Stamped, an even more pronounced rise. Two-thirds of the simple stamped sherds are from pits 1 and 3, where they outnumbered all others; but those from pit 1 appear to be mostly from a single badly shattered vessel. In the other excavation units the proportion of simple stamped to plain was considerably lower and more nearly like that at the other sites. Considering the inadequacy of our sample, I would surmise that, while there may well be an appreciably higher ratio of simple stamped to plainware, as compared with Tobias and Thompson, the actual increase for the Malone site as a whole is perhaps not so great as our figures would indicate. This, of course, is a point which could readily be checked by further fieldwork.

TABLE 10.—*Sherd summary, Malone site*

| Sherds | Mound 1 | | | Pit | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | 6–12 | 12–18 | 18–24 | 1 | 2 | 2A | 3 | 4 | |
| | *Inches* | *Inches* | *Inches* | | | | | | |
| Geneseo Plain | 35 | 26 | 21 | 75 | 121 | 165 | 56 | 26 | 525 |
| Geneseo Simple Stamped | 8 | 15 | 6 | 117 | 31 | 52 | 105 | 1 | 335 |
| Geneseo Red Filmed | | | | | | 4 | 1 | | 5 |
| Other: | | | | | | | | | |
| Check-stamped | | | | | | | | | |
| Cord-roughened | | | | | | 1 | 1 | | 2 |
| Incised | | | | | | 1 | | | 1 |
| Shell-tempered | | | | 11 | 53 | 7 | 2 | | 73 |
| Glaze-paint decorated | | | | | 1 | | | | 1 |
| Total (body) sherds | 43 | 41 | 27 | 203 | 206 | 230 | 165 | 27 | 912 |
| Rims | [1] 20 | | | 16 | 21 | 24 | 21 | (?) | 102 |
| Handles | | | | 1 | 3 | 3 | 1 | 2 | 10 |
| Flat disk base | | | | | 2 | | | | 2 |
| Total (all sherds) | 131 | | | 220 | 232 | 257 | 187 | 29 | 1,056 |

[1] Including several from pit 4.

Although there are no whole or restorable vessels from the site, several large sherds have the same rounding shoulders, constricted necks, and unthickened vertical or slightly flaring rims that characterize the pots from Tobias, and I believe there was little difference in vessel shapes between the two sites. Rim height and attitude are uncertain, owing to the generally small size of the sherds. Of the rim pieces, 40 have a plain rounded lip, 23 have a plain flattened lip, 17 have diagonal incisions, 10 have round or longitudinal punctations, and 9 have "pie-crust" crimping; in no case does there appear to be a significant concentration of any of these treatments in a single excavation unit or series of units. Low rounded applique nodes on the rim exterior just below the lip occur on two sherds, representing as many vessels, from pit 1. One of these vessels evidently had four such nodes spaced equidistant around the rim; it had no handles, was simple stamped, and to all appearances was the source of the great majority of the simple stamped sherds from this pit. A single noded sherd from pit 2, nearly 70 yards away, also belongs to this vessel. Portions of a similar 4-noded rim were found at the Tobias site. Other than this there is no evidence of neck or exterior rim decoration; the plain or incised applique encircling fillet and the row of closely spaced nodes so common at Thompson and present at Tobias is not represented in our collections from Malone.

Handles are represented by 10 specimens, only one of which is complete. Six I class as loop handles, with circular or thick subcircular cross section: one has a single deep broad vertical groove, a pinched-up angle flange, and a tapered end for riveting; another has a vertical flange or rib across the lower (?) angle of attachment; the others show no features requiring special comment. There is one undecorated strap handle running from lip to upper body, and narrowing from the top downward. Another piece shows a riveted handle stump with angle flange; and one sherd has been perforated as if for attachment of a handle by riveting. All of these features again conform to the findings at Tobias and Thompson.

Both examples of the flat disk base are from pit 2. One is small and cannot be further characterized, though its identification seems certain. The second, about 100 mm. in diameter by 7 mm. thick, is shell tempered and belongs to a group of sherds to be noted presently.

Of interest is the very low incidence of Geneseo Red Filmed sherds, of which only five were noted. This ware, it will be recalled, comprised 9.6 percent of the pottery from Thompson, and 12.5 percent of that from Tobias. Whether its poor showing here is due to inadequate sampling or alternatively has some real cultural or chronological basis I cannot say.

The one small incised sherd has a single straight line along one edge, with four short parallel lines running away from the first, which they do not quite touch, at a wide angle. The lines are broad and shallow, but rather better done than most of the clumsy incising found during our work in the locality.

Shell-tempered plainware sherds are more than three times as plentiful as at Tobias or Thompson, but about ⅔ of the pieces are clearly from a single vessel. This is of thick soft ware, heavily tempered with moderately coarse shell particles, and had a flat circular base 100 mm. in diameter. The lip is rounded, with fine diagonal incisions. There is no evidence that the upper part of the vessel was constricted, and it seems in fact not to have been of the usual local shape. From the conformation of the rim and body sherds and their apparent relation to the disk base, I think the vessel was rather small and had approximately the shape of a modern flowerpot, with straight slightly flaring sides and a somewhat more abrupt outcurve at the lip. The dimensions by this reconstruction would be about as follows: base diameter, 100 mm.; rim diameter, 156 mm.; height, 120–125 mm.

*Trade ware.*—This small fragment from pit 2 was not recognized in the field, owing to blackening by fire; it has not been submitted to southwestern pottery specialists for examination, and so I am unable to state its exact identity. The ground or slip color has been altered by burning, but there is unquestionably a narrow band of glaze paint. This, of course, would identify it as a puebloan piece; and in view of the cultural similarities and probable contemporaneity of the site with Thompson, where more glaze-paint sherds were covered, the sherd is probably of the same Rio Grande type there represented.

### OBJECTS OF ANTLER AND BONE

*Antler objects.*—Two thin narrow strips of worked antler (or bone?) suggest a much larger series of somewhat similar pieces from Tobias. One, from pit 3, is curved, tapers in width from 8.5 to 6 mm., and is broken at both ends; it is 46 mm. long by 4 mm. thick, has no perforation or other modification, but has been carefully dressed on all surfaces. The other, from pit 4, measures 24 by 11 by 1.5 mm., is broken at one end and dressed square at the other. Three mm. from the finished end is a hole 3.5 mm. in diameter, with the side nearest the end worn smooth as from action of a cord. The edges and flat surfaces of the piece have been carefully finished; possibly it represents the butt of a needle.

From pit 2 came a large tine of elk antler 30.5 cm. long, which has been hacked and then broken off. The tip is highly polished with fine lengthwise striations that may or may not have been acquired through use by man. The specimen would have made an excellent pick or heavy-duty punch, though it seems rather large and unwieldy for the latter purpose.

*Bison-scapula digging tools.*—These are unquestionably present in great numbers on the site, since more than a hundred use-polished fragments of scapulae were found in our digging. Most of these were so badly broken up that no reasonably accurate estimate can be made of the number of digging tools represented, and even their exact form cannot be determined. Only two sizable specimens, from pits 2 and 2A, retain any appreciable part of the head of the bone, and it therefore appears that this feature was usually detached or much reduced in size and conformation. In both of these specimens the dorsal surface of the neck of the bone has been hollowed out, and much of the cancellous tissue exposed by detachment of the scapular spine and other dorsal irregularities has been removed. This was undoubtedly to facilitate hafting but just how the handle was attached is not clear. The shape of the working edge varied, no doubt depending in part on degree of use, from rounded and spadelike to deeply concave and bifurcate.

*Awls.*—Eleven awls complete enough to permit classification were found. None were of mammal leg bone, but there are two or three polished tip fragments and one unfinished piece 140 mm. long, that suggest this material. Of the classifiable specimens, two were made from the concave face of split rib fragments, with the butt and edges more or less smoothed down and the other end sharpened; they measure 140 by 15 mm. and 73 by 18 mm. Two others were made from irregular face splinters of rib, with little or no smoothing or modification other than fashioning of a long tapered point; they are 87 by 12 mm. and 90 by 10 mm. The remaining 7 specimens have a subtriangular cross section, well finished rounded butts, and were apparently split from the anterior margin of the neural spine of the bison or from the edge of a rib; two complete examples are 63 and 72 mm. long. This is, of course, also the prevalent type of awl at Tobias and Thompson.

*Tapered cylindrical implement.*—From pit 2 was taken the tip end of a very highly polished, symmetrical object with circular cross section, a length of 48 mm. and diameter of 6.5 mm. In size, form, and finish it matches precisely the tips of four complete specimens from Tobias, and I have little doubt that it represents the same type.

*Bipointed implement.*—This specimen is less symmetrical than the preceding and not so well finished. Thickest at the middle, it tapers evenly to a point at each end; the longitudinal shaping striations have been only partially obliterated. In size, 65 by 5 mm., and general appearance it conforms to some of the bipointed objects from Tobias; its use is unknown.

*Scored implements.*—There are three of these, one from pit 2A, and two from pit 3. The first is an irregular fragment 73 mm. long from the convex face of a rib split perhaps by accident or age. The surface is highly polished and bears 10 unevenly spaced transverse grooves that are deepest at the edges of the bone. At one end six grooves cover 2 cm. of the rib, the remaining four being spaced at 1-cm. intervals. Wear along the midline may indicate use as a musical rasp.

One of the specimens from pit 3 is a bison neural spine, with a ragged fracture on one end where it was violently detached from the vertebra. Beginning about 30 mm. below the distal extremity and covering a zone 40 mm. wide, is a series of 8 subparallel incisions extending entirely across the right lateral surface of the bone. The incisions show no wear-polish whatever, and it is to be doubted that they could ever have served as a musical rasp. The posterior border of the bone just above the fractured end appears somewhat worn and polished, suggesting modification for, or by, grasping in the hand. So held, and used paddle fashion, the implement can be used to produce on a plastic substance a ridged effect like that seen on the Geneseo Simple Stamped pottery of the site. This, I believe, was its probable purpose. Total length is 230 mm., width from 55 to 77 mm.

The remaining piece has been broken from the anterior margin of a large rib, cut off and rounded at the vertebral end. Near the opposite broken end are 8 worn transverse grooves and 2 short edge notches possibly marking the position of additional but unfinished scorings. The present length is 110 mm., and breakage was along one of the grooves, indicating that the scored surface, now but 30 mm. long, was once more extensive.

*Tubular beads.*—Made of bird bone, by detaching the articular surfaces, these are similar in all respects to those from Tobias and Thompson. They are straight or slightly curved, with polished sides and neatly finished ends; none bears any incising. Diameter to length ratio varies from 1:25 to 1:10; the smallest specimen is 9 by 1.5 mm., with nearly all of the very slender (diameter under 3 mm.) examples coming from pit 3. On the basis of diameter and length, they break down as shown in table 11.

TABLE 11

| Length<br>Diameter | 0-12 mm. | 12-25 mm. | 25-38 mm. | 38-51 mm. | 51-63 mm. | ?(fgts.) | Total |
|---|---|---|---|---|---|---|---|
| 0-3 mm. | 8 | 8 | 5 | 1 | | | 22 |
| 3-6 mm. | | 3 | 2 | 2 | | 2 | 9 |
| 6-9 mm. | | 1 | | 1 | 1 | | 3 |
| 9-12 mm. | | | | | | 1 | 1 |
| Total | 8 | 12 | 7 | 4 | 1 | 3 | 35 |

*Worked hyoid bone.*—The flattened hyoid bone of a bison, with the ends carelessly detached and the cuts rubbed smooth, has its shaft surface highly polished. There is no perforation, and it could not have been strung. What appears to be a similar piece is figured by Udden (1900, fig. 5, *left*) as a hairpin (?). The present specimen is 62 mm. long by 12 to 15 mm. wide.

### OBJECTS OF CHIPPED STONE

These generally parallel the chipped artifacts from Tobias and Thompson, except that the types represented are somewhat fewer. Gray, whitish, and purple-gray mottled cherts predominate, with some brown jasper and obsidian, and a little Florence flint. Obsidian was represented by 23 flakes and spalls, none exceeding 30 mm. in maximum dimension, and was present in all pits, except pit 1A, and in mound 1. About half the flakes were large enough to have been used in arrowpoint manufacture, but only one piece was so used. Several show dull rounding facets suggesting the surface of a weathered nodule, and it may be that the stuff was carried in in that form as well as in the form of flakes.

*Projectile points.*—There are 51 of these. Thirty-eight are small, triangular, and unnotched, with straight or slightly concave base, straight or slightly convex edges, length of 11 to 35 mm., width of 8.5 to 16 mm., and thickness of 2 to 4 mm.; chipping is usually bifacial and well done.

Nine others have the same basic outline as the above, with a pair of small lateral notches 3 to 7 mm. above the base. Two specimens have finely serrate edges, and one of these has a third notch in the base. Size and other details are as in the above group.

Two larger broader points have a thick triangular blade, shoulders or barbs, and expanding stems with convex or slightly concave bases. Both are slightly damaged, and have blunted edges; they measure 27+ by 19 mm. and 25+ by 17 mm. Two smaller specimens are broken just above the shoulders; they may once have had stems, but otherwise resemble more closely the smaller delicate triangular forms above described.

*Drills.*—Twenty-one specimens, most of them fragmentary, are included here; and they represent the same forms described in some detail from Tobias and Thompson. Eleven may be classed as plain shafted: of these, two whole and six broken specimens are large heavy forms with blunted edges. The whole drills in this group, from pits 1 and 3, measure respectively 96 by 12 by 7 mm. and 73 by 13 by 8 mm. (fig. 65, *b*). Three other plain-shafted specimens are medium to small in size, measuring 30 to 55 mm. long, 6 to 7 mm. wide, and 3 to 5 mm. thick. None of these have any suggestion of a stem.

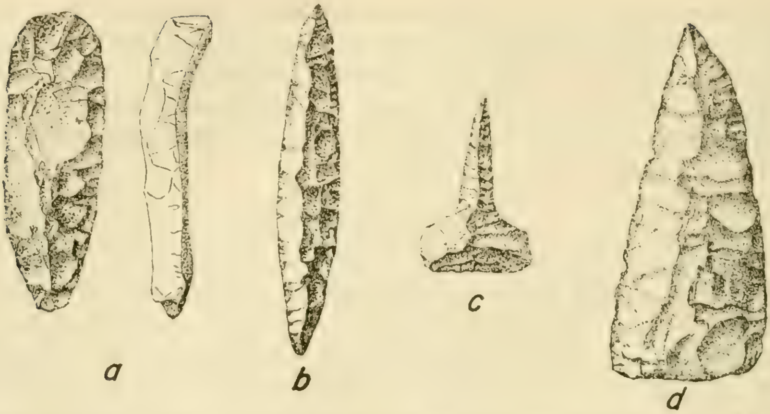

FIGURE 65.—Chipped scraper, drills (*b*, *c*), and trianguloid unbeveled knife (*d*), from Malone site. Length of *b*, 7.3 cm.

Ten drills have the shaft widened at the base (fig. 65, *c*). Two gradually widening, unifacially retouched pieces 26 to 29 mm. long by 12 mm. wide at base, could as well have been graving tools or scarifiers. Six others have a rodlike or slightly tapered shaft 10 to 45 mm. long, retouched from both sides and widening abruptly to a small basal flange which may be wholly, partially, or not at all retouched except next to the shaft; overall length is from 18 to 53+ mm., maximum width of flange up to 25 mm. The remaining two have an abruptly widened large flange, of which only the edges show retouching. This form, it should be noted, was much more plentiful at the Tobias and Thompson sites.

*Knives with beveled edges.*—Here are included five end fragments, both pointed and rounded, with two edges oppositely beveled, and rhomboidal in cross section. One rounded piece with broad notches suggests the base of some of the beveled forms from Tobias, but the blade is missing and final identification is impossible. The narrow, apparently concavely tapered edges of the beveled fragments likewise recall the Tobias and Thompson specimens. There seems good reason to suppose that the tapered and beveled, laterally notched, round-based knives found at these two sites were also present at Malone, even though direct proof is lacking.

*Knives with unbeveled edges.*—Of these there is scant evidence. One oblong specimen from pit 3, 30 by 40 mm., has the edges retouched from both sides. Another from pit 2 is trianguloid, with 2 edges unifacially, and the third bifacially, retouched, and all of them much blunted (fig. 65, *d*).

*End scrapers.*—There are 39 of these objects, of the usual planoconvex, subtriangular to subelliptic form, with the long edges somewhat blunted. They have the same length and width range as those from Tobias. Fourteen (36 percent) are under 30 mm. long, and 31 (79.4 percent) are under 38 mm.; only 2 exceed 57 mm. These proportions parallel the figures for Tobias and Thompson (fig. 65, *a*).

*Side scrapers.*—Some 25 or 30 spalls and flakes of varied form and size have one or two edges retouched from the convex side while the other face is left flat, or nearly so, and unretouched. They range from small pieces suggesting flake knives up to objects 90 mm. long. I have not considered it worthwhile to attempt to classify them further.

*Chopping tools* (?).—Notched axes such as occurred at Tobias and Thompson were not found at Malone. From all parts of the excavations, however, came large oblong pieces of chert and jasper, coarsely chipped and not retouched. Some of these may have been chopping tools, though in few instances do the edges show the expectable signs of battering; it is possible they represent blanks or are residual masses from which flakes were obtained for making projectile points and other small objects.

### OBJECTS OF GROUND AND PECKED STONE; PIGMENTS

*Grooved mauls.*—Two complete and three fragmentary mauls were found; with exception of one fragment from pit 1, all came from pit 3. The complete specimens are cylindrical or approximately so, with well-defined circular flattened striking surfaces and a full encircling groove. They belong to the Group I type elsewhere defined from the Tobias site; both are well made and show no evidence of heavy use. One is of pink Sioux quartzite, measures 72 by 67 mm., and weighs 17 ounces; the other, of brown quartzite, is 105 by 90 mm., and weighs 34 ounces.

A diagonally split and incomplete maul from pit 1, with parts of a wide groove and both polls, was apparently laterally flattened, more or less elliptical in outline, with rounded polls. It probably is assignable to Group III, and was of medium size; material is dark purplish-black quartzite.

Of the remaining two specimens, one is a badly shattered and incomplete maul of Dakota sandstone that has evidently had very hard use; the original dimensions, weight, and form can no longer be determined. Also of indeterminate type is a small segment split from one end of a maul, showing traces of a groove and rounded poll.

*Mealing stones.*—From the mound test came the fragment of a shaped slab of dark purple-brown sandstone, with deeply worn pitted upper surface that shows much polish from grinding. The edge is somewhat raised, but not definitely flanged, and the grinding surface appears to have been evenly concave from edge to edge of the slab. It was shaped by spalling off the sides, which, like the bottom, show no further dressing.

A thin irregular slab of Dakota sandstone from pit 2 is slightly tapered at one end and broadened at the other; the edges have been dressed roughly to a squarish form. Despite local unevennesses, both surfaces show an overall flatness, with one side very slightly concave lengthwise and showing considerable indication of grinding, apparently by a long mano used with a back and forth motion. The slab measures 390 by 250 by 22 mm.

No handstones for use with mealing stones were found.

*Mortar.*—A thick broken sandstone block seems to have been originally more or less squarish with round corners and flattened base. It is 135 by 145 (?) by 58 mm., with a concavity on one surface measuring 110 by 120 by 5 mm. Too small to have been used with a mano, this was perhaps an anvil used with a stone hammer for crushing pemmican, berries, and other food.

*Discoidal rubbing stone.*—This specimen, from pit 3, is of granite, circular in outline with convex sides and two flattened surfaces, one of which may be natural. Measuring 76 by 60 mm., the object fits the hand nicely, and it may have been a rubbing stone despite the fact that no great degree of wear is indicated.

"*Sinew-stone*".—A subcircular quartzite cobble, with one flattened surface, has a groove running partway over the convex back from one rounded side; on the opposite edge of the back is a faint suggestion of a similar feature. The grooves do not show the polish exhibited by the "sinew-stones" from Tobias, and the resemblance between the two may be accidental. The object measures 88 by 57 mm.

*Shaft smoothers.*—Twenty-six specimens, only three of them complete, indicate the presence of the boat-shaped, paired arrowshaft buffer; they resemble in all particulars the similar objects from Tobias and Thompson. Complete examples are 60 to 128 mm. long, 29 to 40 mm. wide, and 14 to 22 mm. thick. Several specimens are grooved on two or more faces; one, has a narrow V-shaped line down the middle that probably represents the start of a groove (fig. 66, *a*). Secondary use for awl sharpening is indicated. No matched pairs were found.

Of unusual interest are two objects showing the method of manufacture. One, from pit 3, is a shaped rectangular sandstone block 163 by 75 by 33 mm., with both wide surfaces and the edges converging somewhat toward the slightly convex ends; all surfaces have been carefully, if somewhat asymmetrically, rubbed down. Lengthwise down the approximate midline of each of the two wider surfaces runs a deep V-shaped groove about 10 mm. deep and somewhat curved. At one end the two grooves touch; a little more sawing along either or both of them, or a sharp blow along the groove, would have split the block

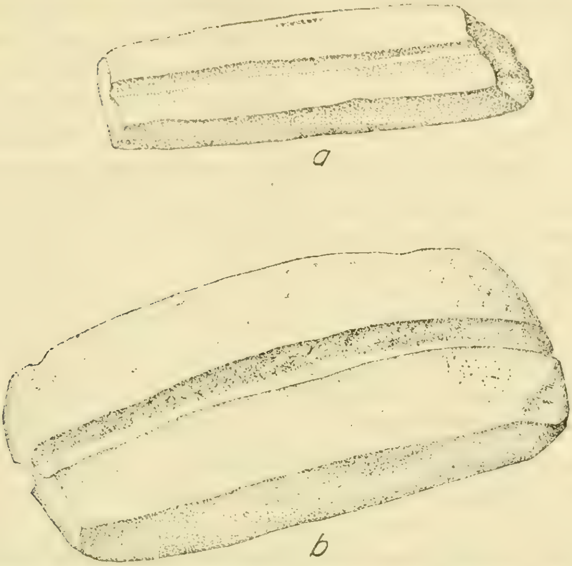

FIGURE 66.—Sandstone arrowshaft-smoothers, finished and unfinished, from Malone site. *a*, Longitudinally grooved, presumably one of a pair. *b*, Large shaped block sawed longitudinally on both sides for splitting to form a matched pair. (USNM 389314.)

into two nearly identical portions (fig. 66, *b*). With the fracture scars then reduced by grinding, the workman would have a matched pair ready for grooving and subsequent utilization. A similar partially split block has been reported from the Leary site (Hill and Wedel, 1936, p. 47 and pl. VII, c), and the early 19th century Hill site has yielded several matched pairs of finished smoothers (Wedel, 1936, pl. 7, p–r). The manner of their use has already been noted.

The midsection of another similarly grooved but unsplit block came from pit 2; it was from a smaller specimen, and had a few short narrow grooves possibly from secondary use for sharpening awls and other objects.

*Pigments.*—There are several small irregular lumps of dark-red hematite, with broad striated facets made by grinding or scraping off powder for red paint. None appear to have been otherwise altered or prepared.

A very irregular lump of dirty yellowish material from mound 1 gives a bright yellow powder when rubbed or cut. There are no wear facets or grinding striations, but the piece was certainly carried in by the Indians and the only evident purpose would be for paintmaking. In size, it measures about 40 by 60 mm.

### OBJECTS OF SHELL

The shells of 9 species of fresh-water mollusks were found; 17 specimens were unworked and 1 had been fashioned into an ornament. All are local forms, and were probably taken from nearby Cow Creek. Again, I am unable to say whether, or to what extent, shellfish were used for food, but the scarcity of artifacts, of shell tempering in the pottery, and of other evidence that the shells primarily were sought, seems to me to argue for the use of the animals as food. Specimens of the following species are represented:

| | |
|---|---|
| *Uniomerus tetralasmus* (Say) | 6 |
| *Lampsilis anodontoides* (Lea) | 3 |
| *Strophitus rugosus* (Swainson) | 2 |
| *Quadrula quadrula* (Raf) | 2 |
| *Quadrula pustulosa prasina* (Conrad) (worked) | 1 |
| *Anodonta grandis* (Say) | 1 |
| *Lasmigona complanata* (Barnes) | 1 |
| *Carunculina parva* (Barnes) | 1 |
| *Ligumia subrostrata* (Say) | 1 |

*Whole shell pendant.*—This was a small valve of *Quadrula pustulosa prasina* (Conrad), altered only by the boring of a 3-mm. perforation immediately below the umbo. Most of the whole shell pendants from the Tobias site were made from shells of the same species.

### OBJECTS OF WHITE MANUFACTURE

In a filled rodent burrow, near the bottom of pit 1, was found a heavily oxidized and as yet unidentified piece of iron. It is about 52 mm. long, and tapers evenly from a diameter of about 6 mm. at one end to a point at the other. I am unable to say whether it was once a part of the original pit fill, or was introduced in more recent times via the burrow.

## TRAIT COMPARISON OF SITES ON LITTLE ARKANSAS RIVER AND COW CREEK, RICE COUNTY

The artifacts described in detail in the preceding pages, from the Tobias, Thompson, and Malone sites, have been inventoried in table 12. The close interrelationships between the three sites, so far as material culture is concerned, are obvious. The list is most complete for the Tobias site, where the greater part of our work was done; and in our collections from Tobias are represented virtually every item indicated for Malone and nearly every one found at Thompson. In general, where items occur at two or more sites, the table shows a greater number at Tobias, which is expectable in view of our larger sample from there. There are exceptions, to be sure, as for example in the matter of filleted rims, but here it is probably the influence of a single potter or family of potters and no particular chronological or general developmental implications are suggested. The materials from the three sites are so similar that pieces from either Thompson or Malone, if mixed with corresponding types from Tobias, could not be distinguished.

TABLE 12.—*Artifact summary of three sites in Rice County*

[P=Present]

| Artifacts | Tobias, 14RC8 | Thompson, 14RC9 | Malone, 14RC5 |
|---|---|---|---|
| Pottery: | | | |
| Grayware, sand tempered: | | | |
| Type Geneseo Plain: sherds | 3,610 | 1,616 | 525 |
| Type Geneseo Plain: restored jars | 4 | ----- | ----- |
| Type Geneseo Simple Stamped: sherds | 615 | 220 | 335 |
| Type Geneseo Simple Stamped: restored jars | 3 | ----- | ----- |
| Check-stamped vessel, restored | 1 | ----- | ----- |
| Check-stamped sherds | 4 | 10 | ----- |
| Base sherds, flat, circular | 1 | 1 | 2 |
| Rim vertical, filleted below lip | 7 | 77 | ----- |
| Rim vertical, noded or fingernail gouged | 32 | 19 | ----- |
| Lip rounded or flattened, plain | 220 | 100 | 63 |
| Lip rounded or flattened, diagonal incised | 85 | 90 | 17 |
| Lip scalloped | 46 | 20 | 9 |
| Lip: other | 39 | 59 | 13 |
| Handles, loop (including fragments) | 15 | 12 | 6 |
| Handles, loop, tenoned | 9 | + | 1 (+) |
| Handles, loop, decorated | 2 | ----- | 1 |
| Handles, loop, angle nodes | ----- | 2 | 2 |
| Handles, strap (including fragments) | 12 | 8 | 4 |
| Handles, strap, riveted | 2+ | + | 1 (+) |
| Handles, strap, decorated | 5 | 5 | ----- |
| Handles, strap, angle nodes | ----- | ----- | 1 |
| Redware, sand-tempered: | | | |
| Type Geneseo Red Filmed: sherds | 392 | 204 | 5 |
| Type Geneseo Red Filmed: incompletely restored jar | 1 | ----- | ----- |
| Lugs, perforated | + | ----- | ----- |
| Other: | | | |
| Cord-roughened sherds | 142 | 14 | 2 |
| Shell-tempered sherds | 108 | 43 | 73 |
| Incised body sherds | 14 | 7 | 1 |
| Painted sherds | 12 | ----- | ----- |
| Rio Grande glaze paint sherds | ----- | 4 | 1 |
| Chupadero Black on White sherd | 1 | ----- | ----- |
| Red-filmed exotic sherds | ----- | 6 | ----- |
| Clay pipe fragment, incised | ----- | 1 | ----- |
| Antler artifacts: | | | |
| Hollowed tines | 3 | ----- | ----- |
| Projectile point, conical, socketed | 1 | ----- | ----- |
| Scored rodlike object | 1 | ----- | ----- |
| Socketed basal section | 1 | ----- | ----- |
| Socketed and/or notched strips, fragments | 14 | ----- | 2 |
| Eyed pieces (needle fragments ?) | 1 | 2 | ----- |
| Miscellaneous pieces | 6± | ----- | 1 |
| Cylindrical worked section | ----- | 1 | ----- |
| Bone artifacts: | | | |
| Digging tools, of bison scapula | 60+ | 25+ | P |
| Pick, of bison ulna | 1 | ----- | ----- |
| Awls: split mammal leg bone | 4 | 6 | ----- |
| Awls: of neural spine or rib edge | 37 | 7 | 7 |
| Awls: of split rib or rib face splinters | 13 | 4 | 4 |
| Stemmed objects (projectile points) | 8 | ----- | ----- |
| Four-sided objects (projectile points(?)) | 6 | ----- | ----- |
| Tapered cylindrical objects (projectile points(?)) | 4 | ----- | 1 |
| Bipointed objects | 9 | ----- | 1 |
| Polishing tools(?): triangular cross section | 3 | 4 | ----- |
| Polishing tools(?): of animal rib | 2 | ----- | ----- |
| Pointed split-rib objects | 5 | 1(?) | ----- |
| Arrowshaft straighteners, of rib | 2 | 1 | ----- |
| Scored implements, of rib | 14 | 2 | 3 |
| Scored implements, of neural process | 1 | ----- | ----- |
| Cancellous bone objects: paint applicator(?) | 1 | 2 | ----- |
| Cancellous bone objects: other | 2 | ----- | ----- |
| Gambling chips(?) | 2 | ----- | ----- |
| Bison hyoid, dressed | 1 | ----- | 1 |
| Incised strip, fragments | 3 | ----- | ----- |
| Tubular beads | 90 | 18 | 35 |
| Miscellaneous objects | P | 6 | ----- |
| Chipped stone: | | | |
| Projectile points: | | | |
| (a) Small, triangular, unnotched | 134 | 39 | 38 |
| (b) Small, triangular, notched | 44 | 11 | 9 |
| (c) Subtriangular or leaf-shaped, crude | 14 | 21 | ----- |
| (d) Large, triangular, notched | 11 | ----- | ----- |
| (e) Large, stemmed, edges blunted | 7 | ----- | ----- |
| (f) Other | ----- | 1 | 4 |

TABLE 12.—*Artifact summary of three sites in Rice County*—Continued

[P=Present]

| Artifacts | Tobias, 14RC8 | Thompson, 14RC9 | Malone, 14RC5 |
|---|---|---|---|
| Chipped stone—Continued | | | |
| Drills: | | | |
| (a) Plain-shafted, large, heavy (including fragments) | 50 | 7 | 8 |
| (b) Plain-shafted, large, heavy, stemmed for hafting | 9 | 2 | --- |
| (c) Medium-sized, stemmed | 3 | 2 | 3 |
| (d) Shaft gradually widening, expanded base | 4 | 1 | 2 |
| (e) Shaft abruptly widening, large flange | 21 | 10 | 2 |
| (f) Shaft abruptly widening, small flange | 1 | 1 | 6 |
| (g) Other | 5 | 3 | --- |
| Knives, with unbeveled edges | 20+ | 4+ | 2 |
| Knives, with beveled edges, notched or stemmed | 17 | 5 | 1 |
| Knives, with beveled edges, not notched or stemmed | 4 | --- | --- |
| Beveled fragments, unclassified | 34 | 16 | 4 |
| End scrapers | 250+ | 159 | 39 |
| Side scrapers | 200+ | 100+ | 25+ |
| Chopping tools, notched (axes) | 8 | 5 | --- |
| Ground and pecked stone: | | | |
| Mauls, grooved: | | | |
| Cylindrical, flattened polls | 3 | 1 | 2 |
| Subcylindrical, rounded polls, asymmetrical | 5 | 2 | --- |
| Asymmetrical, one poll rounded, other flattened | 1 | --- | --- |
| Large, damaged, unclassifiable | 8 | --- | 3 |
| Hammerstones | 6 | --- | --- |
| Mealing stones: | | | |
| Flat grinding surface (including fragments) | 1 | --- | 2 |
| Elliptic concavity | 2 | --- | --- |
| Manos | 7 (+5) | 3 (+4) | --- |
| Mortars | 3 | --- | 1 |
| Discoidal rubbing stones | 1 | 1 | 1 |
| "Sinew-stones" | 2 | --- | 1 |
| Shaft smoothers, longit. grooved (including fragments) | 11 (+90) | 5 (+38) | 3 (+23) |
| Sharpening blocks | 5+ | --- | --- |
| Rubbing stones | --- | 8 | --- |
| Shaft polishers, limestone | 3 | --- | --- |
| Pipes: | | | |
| L-shaped, high bowl | 2 (+6) | 1+ | --- |
| Elbow type, low bowl, projecting stem | 2 | --- | --- |
| Tubular | 2 | 1 (?) | --- |
| Catlinite objects (other than pipes) | 2 | --- | --- |
| Turquoise beads, etc | 34 | --- | --- |
| Sandstone disks: | | | |
| Perforated | 4 | --- | --- |
| Imperforate | 3 | --- | --- |
| Miscellaneous objects | 4 | --- | --- |
| Unworked stone, etc.: | | | |
| Concretions | 2 | --- | --- |
| Pseudomorphs | 3 | --- | --- |
| Pigments | P | 3 | P |
| Prepared cake of pigment, fragment | --- | 1 | --- |
| Shell objects: | | | |
| Beads, disk | 4 | --- | --- |
| Pendants of whole shell | 11 | --- | 1 |
| Pendants of cut shell: circular or nearly so | 2 | --- | --- |
| Pendants of cut shell: other | 19 | --- | --- |
| Tapered objects, imperforate | 2 | --- | --- |
| Spoons (?) | 1 (+1) | --- | --- |
| Perishable materials: | | | |
| Wood, worked | 4+ | --- | --- |
| Cordage, twisted | 1 | --- | --- |
| Basket, coiled | 1 | --- | --- |
| Objects of European manufacture: | | | |
| Awl, iron, double-pointed | 1 | --- | --- |
| Axblade, iron | 1 | --- | --- |
| Chain mail, iron | --- | 4 | --- |
| Unidentified iron | 1 | --- | 1 |
| Copper, rolled beads | 3 | --- | --- |
| Glass beads | Ca.150 | --- | --- |
| Miscellaneous traits: | | | |
| Refuse mounds, small | 19+ | 10+ | (?) |
| Storage pits, secondarily for refuse | 8+ | 5+ | 4+ |
| House type | ? | ? | ? |
| Village sites large, unfortified | + | + | + |
| "Council-circle" complex | 1 | --- | --- |
| Maize | P | P | P |
| Beans | P | --- | --- |
| Bison remains abundant | + | + | + |

Of the items listed for the Tobias site only, there are a number that from their occurrence in pits and mounds may be expected to turn up in similar features at the other sites with more extended sampling. This includes beveled but unstemmed and unnotched knives, hammerstones, mealing slabs with elliptic concavity, sandstone sharpening blocks, limestone shaft polishers, perforate and imperforate sandstone disks, concretions and pseudo-morphs, catlinite, and possibly objects of European manufacture.

Another group of objects was found at Tobias under circumstances that suggest a special or restricted use, and I would suspect that their occurrence at the other sites might be extremely limited. Included are painted sherds of non-southwestern type; stemmed, four-sided, and tapered cylindrical bone objects (projectile points?); large triangular notched and large-stemmed blunted chipped-stone points; stone elbow pipes with projecting stem; turquoise; most of the shell ornaments and perishable objects of wood or textile; and perhaps the hollowed antler tines. Almost without exception, these items were found exclusively in Basins 1 and 2 of the mound 17 complex at Tobias. For the extremely limited instances of worked wood and basketry this occurrence perhaps reflects nothing more than favorable conditions of preservation, i. e., charring by a possibly sudden and unexpected conflagration that precluded rescue of household furnishings. For the chipped stone, bone, and shell objects enumerated this explanation seems less likely. Future excavations at the Tobias site on a larger scale than ours may disclose the presence of these items in refuse pits or mounds, in which case, as objects of common or everyday use, they might be expected to show up also at the neighboring sites. If, on the other hand, their apparent restriction to Basins 1 and 2 is borne out by future work, they should be watched for in other sites primarily where a "council-circle" complex is indicated, which is not the case at Thompson or Malone. Their significance then will probably be bound up with a determination of the meaning of the "council-circles" in terms of possible social, political, or ceremonial concepts—an intriguing problem toward whose ultimate solution our work alone cannot give a definitive answer.

The close similarities between the material culture remains from the three sites, with regard to work in pottery, bone, and stone, as well as the pattern of settlement and the inferred subsistence economy, indicate, I think, that we are dealing with a recurring complex of traits. It seems very probable, too, that the three sites were occupied contemporaneously, or approximately so. On the basis of evidence now available, I suggest that the Tobias, Thompson, and Malone sites can be considered, in taxonomic parlance, components of a single manifestation to be designated the Little River Focus. I suspect that the Hayes and Major sites briefly noted elsewhere will also be found ultimately to fall within this unit, but there is at present insufficient evidence to clinch this point. The Paint Creek site in McPherson County (Udden, 1900; Wedel, 1935, pp. 238–250 and cf. p. 252) is probably another component, but unfortunately there has been no opportunity for me to attempt reanalysis of the several collections from there. In all probability there will be still other components to add as fieldwork and analysis progress.

## SITES ON WALNUT RIVER, COWLEY COUNTY

Five or six miles above the point where Arkansas River passes southward out of Kansas, it receives its last major affluent—Walnut River—from the north. Rising in northern Butler County, the Walnut follows a southward course for about 75 miles to its mouth, receiving en route the Whitewater River from the west and a series of lesser, but still perennial, creeks from the east. The drainage basin includes the western slope of the Flint Hills, where extensive areas of gently rolling pasture land still remain, and so there has been less silting of the riverbed than in most Kansas streams. Throughout much of its course, the Walnut runs in a fertile flat-floored valley 1 to 3 miles wide, bordered by picturesque limestone bluffs and ledges. A luxuriant growth of hardwoods fringes the immediate banks, and formerly this covered much of the adjacent bottoms as well. The stream carries a generous flow of clear water; and when the midsummer sun lies heavy on the nearby uplands, the placid tree-shaded pools and rocky riffles of the Walnut are a welcome sight indeed to the weary traveler.

As the Walnut approaches its junction with the Arkansas, it hugs the lofty bluffs on the left or east bank. About 4 miles north of the confluence, the line of bluffs on the right bank curves westward to disappear gradually into the wide alluvial plain of the Arkansas, and the Walnut is bordered on the west by a mile-wide strip of rich alluvial terraces and bottoms relieved here and there by partially filled segments of abandoned river channel. On the higher, relatively flood-free, portion of the terrace between the converging Walnut and Arkansas Rivers is situated Arkansas City, the heart of a flourishing livestock, grain-growing, and industrial district. It is now abundantly clear that some hundreds of years ago, when Spanish enterprise first led white men into what is now Kansas, the nearby banks of the lower Walnut were already the center of a thriving human community.

There is apparently no detailed eyewitness description of the Arkansas City locale as it was in the heyday of the Indian, but the observations made by Captain Bell (James, 1823, vol. 2, pp. 216–221;

see also Fuller and Hafen, 1957, pp. 231–235) during his descent of the left bank of the Arkansas in 1820 afford some understanding of the appearance of the countryside before the farmer and stockman altered its face. Bell's detachment camped on the night of August 16 opposite the mouth of Ninnescah River near the Sumner-Cowley County line and about 20 or 25 miles northwest of Arkansas City, noting that—

> We have now passed the boundary of the summer bison range, and the wolves, those invariable attendants on that animal, are now but rarely seen. The antelopes also have disappeared. The [Arkansas] river banks, as well as those of creeks, and some ravines, from near the little Arkansa, are pretty well wooded, with but few interruptions. In many parts, the growth is dense, but always, as yet, strictly limited to skirting the water courses.

On the 17th, the party remained in camp during the morning while four hunters replenished the larder; and—

> towards noon they all returned with but three turkeys, of which two were young; they saw no deer, but much elk sign. . . . Two fauns [sic] were killed during this afternoon's journey of twelve miles, and a black bear was seen.

On the 18th, leaving their camp near Little Beaver or Spring Creek in present Cowley County, Bell observes that—

> At the distance of eleven miles, we crossed a small river, flowing with a very gentle current over a gravelly bed, with a breadth of fifty or sixty yards, and an extreme depth of three feet. It has been named Stinking Fork [now Walnut River]. Its western bottom is of considerable width, well-wooded with the before-mentioned description of trees [principally oak, some walnut, elm, ash, mulberry, button-wood, cotton-wood, and willow—p. 216], in addition to which the hackberry (Celtis) here first appears, together with a crowded undergrowth of pea vines, nettles, and rock weeds, which obstruct the passage of the traveller. The eastern bank, upon which our noon-day encampment was established, was high, rocky, and precipitous, requiring considerable exertion to surmount it.

When the party resumed its journey in the afternoon, it was noted that—

> The appearance of the country had now undergone a somewhat abrupt change. Low scrubby oaks, the prevailing trees no longer exclusively restricted, as we have hitherto observed them, to the mere margin of a watercourse, now were seen extending, in little clusters or oases, in the low grounds. In the ravines, which are numerous, profound, abrupt, and rocky, we observed the hickory (Caria of Nuttall) which had not before occurred since our departure from the forests of the Missouri.

Eight miles from the Stinking Fork or Walnut, the party—

> . . . encamped for the night, on the east side of a creek which we call Little Verdigris [now Grouse Creek].
>
> It is about 40 yards in breadth, and not as deep as the Little Neosho [i. e., the Stinking Fork or Walnut]; its bed is gravelly, but the foot of each bank is so miry that we experienced some difficulty in crossing. There is but a slight skirting of forest . . .

> One of the hunters returned with the information, of his having discovered a small field of maize, occupying a fertile spot at no great distance from the camp; it exhibited proofs of having been lately visited by the cultivators. . . . We took the liberty, agreeably to the custom of the Indians, of procuring a mess of the corn, and some small but nearly ripe watermelons, that were also found growing there, intending to recompense the Osages for them, to whom we supposed them to belong.

On the following morning, the 19th—

> Several small cornfields were seen this morning along the creek. At a short distance from our place of encampment, we passed an Indian camp, that had a more permanent aspect than any we had before seen near this river. The boweries were more completely covered, and a greater proportion of bark was used in the construction of them. They are between sixty and seventy in number.
>
> Well worn traces or paths lead in various directions from this spot, and the vicinity of the cornfields induces the belief that it is occasionally occupied by a tribe of Indians, for the purposes of cultivation as well as hunting.

Captain Bell's statements are of interest not only because of their information on the contemporary fauna, flora, and topography of the locality, but also for the glimpse they give us into the ethereal nature of the early 19th-century Indian occupation. This was the hinterland of the Osage, whose principal villages were far to the east, on the Osage and Verdigris Rivers. The precise spot where stood the "boweries" seen by the party is not known, nor is it likely that even if identification were made, its examination would yield any information useful to the archeologist. The Osage, except as hunters and raiders, were late comers to this region, and had no direct connection with the archeological remains whose excavation is reported in the following pages. Since Bell makes no mention of mounds or other antiquities hereabouts, it is probable that he crossed the Walnut within a mile or so of its mouth. Even a short ride upstream from the noon encampment on the high east bank would have put the party in the midst of unmistakable signs of former Indian habitation.

For present purposes, the remains investigated by our party on the lower Walnut have been grouped under three site headings (fig. 67). The high degree of uniformity manifested in the collections and in their manner of occurrence suggests that this grouping is an arbitrary one, and that the sites may actually have been merely local concentrations of population within one great rambling community. In the short time we spent here (August 5 to 26, 1940), and with our limited manpower, it was impossible to make anything like a complete survey, and so the precise limits of the area of former habitation cannot be indicated. From our own observations, together with the reports brought to us by local collectors, it would appear that the valley floor on the west side of the Walnut, and also the high bluffs on the east, are or formerly were littered with sherds, flints, and other detritus

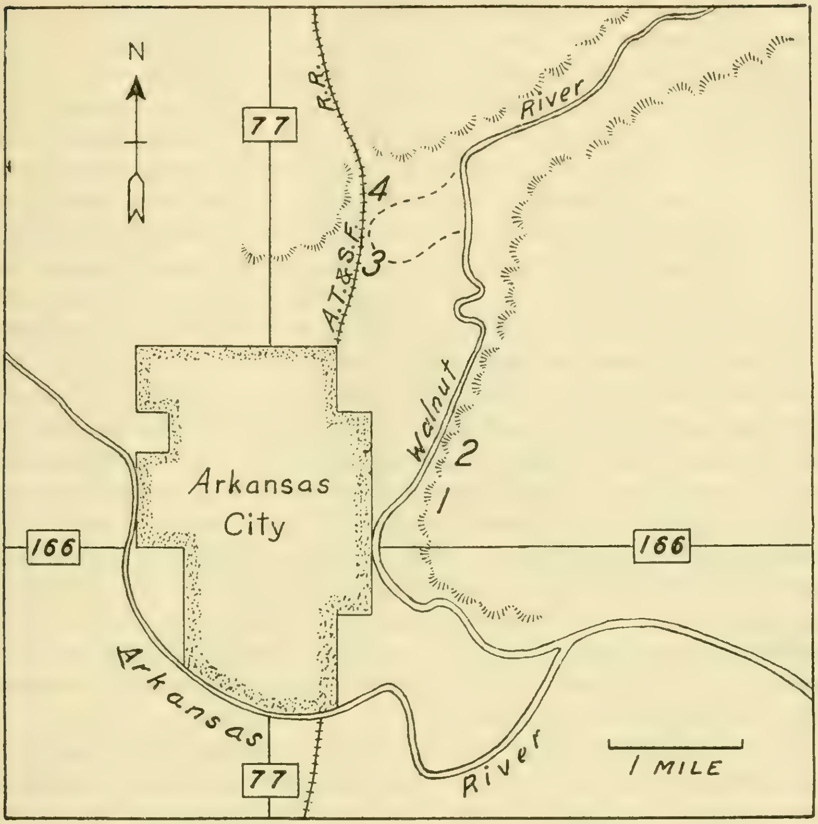

FIGURE 67.—Map of Arkansas City and nearby archeological sites. *1*, Arkansas City Country Club, 14CO3; *2*, Elliott, 14CO2; *3*, *4*, Larcom-Haggard, 14CO1.

for a distance of several miles northward from the Walnut River crossing of U. S. Highway 166. Most of this ground has been under cultivation for many years, thus further complicating the problem of accurate site delineation.

### LARCOM-HAGGARD SITE (14CO1)

About 2 miles north by east of Arkansas City, Walnut River today swings from a southwesterly to a nearly due southward course. At one time, however, the stream apparently continued toward the southwest for nearly a mile farther, to within a hundred yards of an east-facing limestone-capped bluff, whence it described a wide sweeping curve to the south and finally flowed in an easterly direction again. Between the bluff and the abandoned stream channel, at the west end of the old loop, is a narrow terrace (pl. 51). This terminates on the north at a small ravine which descends from the bluff and uplands beyond; to the south, the terrace widens to merge into the broad interfluvial plain on which Arkansas City is situated. The line of the Atchison, Topeka and Santa Fe Railroad from Arkansas City to Winfield traverses this strip of terrace, finally passing out of the valley on to the uplands by way of the ravine at the north end. The old channel is now dry, except in times of heavy rain or flood, and much of it is under cultivation; portions are overgrown with trees and underbrush. Our camp was set up about a half mile east of the site on the bank of the channel in a fine grove of native pecan trees.

The Larcom-Haggard site lies on the narrow terrace between the bluff and the former river bend. Evidences of Indian occupancy are scattered all along the terrace, beginning at the ravine on the north and continuing south and indefinitely east around the bend. We were not able to determine exact limits for the site, owing to the unfavorable condition of the ground and the absence of mounds or other readily discovered surface features. It seems probable, however, that remains occur for some hundreds of yards south and southwest from the terrace front skirted by the old channel. The bulk of our collections came from a cluster of abandoned caches, pits, and shallow middens at the north end of the terrace, with a few additional samples from pits farther south; no traces were noted west of the railroad right of way. The whole area, we may point out, has been under long cultivation, and subsurface material was found only after diligent and strenuous testing of all likely spots accessible to us.

To describe individually and fully our findings in each of the 25 or 30 separate features excavated by us at this site would involve needless repetition of details. Broadly speaking, approximately 20 of the features were pits with more or less regular and clearly definable outlines, which we identify as former caches. They were somewhat smaller than most of the storage pits described elsewhere in this paper from Rice County, and a rather larger proportion of them were cylindrical, rather than bell shaped, in form. Dimensions varied widely. Mouth diameters ranged from 24 to 75 inches; bottom diameters, from 25 to 75 inches; and depth, from 24 to 113 inches. Some contained a dark, hard, earthy fill, with relatively few artifacts; in others, the fill was soft and ashy, often with layers or lenses of nearly pure wood ashes, and there was a comparative abundance of potsherds and worked stone, bone, and shell. Bits of charred twigs and sticks were universally present, and all of the pits yielded quantities of animal bone and limestone fragments, both burned and unburned. None showed any evidence of a grass or other lining or floor covering. One pit, No. 3, had what may have been a false bottom—a 14-inch layer of hard sterile clay, beneath which was 18 inches of refuse.

In at least two instances, it was found that later pits had been dug so as to partially overlap earlier structures. Pit 4, e. g., actually consisted of three overlapping pits; and No. 12 had been partly cut away by a later pit designated 12A. In neither instance, however, was there any observable difference in the type of material from the original pit as compared to that from the subsequent intrusive structures, and no great lapse of time or perceptible change of culture can be inferred.

In addition to the usually well-defined cache pits, six or seven small irregular concentrations of refuse identified as middens were excavated. These occurred mainly along the immediate edge of the terrace, or on its sloping front near the base. In no case could definite wall lines or floors be determined; the refuse simply thinned out in all directions from a more or less central line or point of maximum thickness and richness. I suspect that this results from the original dumping of village refuse in shallow gullies or other low spots and "wash-outs," and the subsequent gradual spreading of such material by natural agencies or, more recently, by the plow. One such deposit reached a depth of 60 inches; most were under 24 inches. The fill in these presumed middens did not differ markedly from that in the caches; the soil was usually dark in color, streaked with ashes and charcoal, and intermingled with bone refuse, stones, sherds, and occasional discarded or lost implements.

Several hundred yards south of the main cache cluster, near the Larcom farm buildings, was a small circular basin, 14 inches deep by 28 inches in diameter. This contained a tightly packed fill of thousands of flint chips, mostly of pink foraminiferal chert, two knives, a scraper, and a few bone fragments. The basin was obviously dug by the Indians, and its contents suggest a raw materials cache or the accumulated rejectage left by some long-dead aboriginal flintsmith.

All the excavations summarized above were made on the west bank of the old river channel. The ground within the bend, on the former east or left bank, is lower, and was probably subject to more frequent overflow than was the main village terrace. A single small test was made in this area in a slight rise of ground showing a few chips and other surface materials. A broken bone awl, a large pile of chert spalls and chips, red ocher, mussel shells, and a shell-tempered rimsherd came to light, indicating that some sort of workshop or domestic activity had been carried on at the spot.

### ELLIOTT SITE (14CO2)

On the high rolling bluffs east of Walnut River, a little more than a mile from the Larcom-Haggard site and just north of the Arkansas City Country Club grounds, is another archeological zone of uncertain, but probably considerable, extent. Surface evidences today, after years of cultivation, consist principally of innumerable chert fragments and broken animal bones, with occasional potsherds. These occur to a distance of several hundred yards back from the edge of the bluff, and for perhaps a mile in a north to south direction. The descent to the river at the foot of the bluff is generally abrupt and difficult, but near the south edge of the site is a deep wooded ravine with an excellent spring. This is comparatively easy of access, and no doubt furnished water to a substantial proportion of the one-time surrounding aboriginal population.

Heavy rains, which forced a temporary suspension of farming activities, afforded us an opportunity for three days of excavation on the site, and incidentally helped us to locate the most promising spots for our tests. These spots stood out in marked contrast to the surrounding brown soil; they were much darker in color, and contained quantities of bone, flint chips, occasional artifacts, and bits of burnt clay. In part, these discolored areas seemingly indicate former low refuse mounds that have been reduced by the plow; others are clearly old cache pits. Some, though unquestionably due to former Indian activities, cannot be certainly recognized as to their original purpose.

Eight separate subsurface structures were opened in our investigations. Six were identified as caches, and are designated as pits in the ensuing discussion; the other two were unidentified and so were designated noncommittally merely as features. All lay within a comparatively limited area measuring not over 70 by 50 yards.

The six cache pits conformed in all essentials to the usual Plains type—circular in plan and bell shaped in vertical section, with the greatest diameter at the bottom. In size, they were small to medium; depth varied from 43 to 56 inches; diameter, from 30 to 47 inches at the top and from 41 to 67 inches at the bottom. The mixed fill within was easily distinguished from the surrounding undisturbed red–brown clay, so that there was no difficulty in defining pit walls and floors. All the pits contained dark soil streaked with charcoal and ashes, the ashes sometimes occurring as strata from a few inches to a foot thick. Great quantities of bone refuse, burnt and unburnt limestone fragments, and chert spalls were intermingled with this fill, as were, in much smaller amount, mussel shells, potsherds, stone and bone implements, and charred kernels of corn. Layers of charred jointgrass and twigs from a half-inch to 2 inches thick covered the floors of pits 4 and 5, suggesting the remains of a former straw lining perhaps designed to protect stored foodstuffs against ground moisture. The floor of pit 1 was roughly paved with unfitted and unshaped limestone slabs 2 or 3 inches thick by 6 or 8 inches across; pit 5 had a similar but less complete flagstone pavement resting on its charred floor lining.

The larger of the two unidentified structures, feature No. 3, was a well-defined shallow circular basin 10 feet in diameter. Situated on a gentle slope, its floor lay 12 to 18 inches below the general ground surface, with a perceptible dip from the periphery to the center. Below the plowed topsoil and a stratum of washed-in red clay, the sharply upturned walls of the basin were clear and unmistakable. Within the basin, the soil to a depth of 3 or 4 inches above the floor was mixed with some animal bone and similar refuse, containing in addition much charred grass, twigs, and segments of sticks. Of interest was the presence of thin bits of burnt clay daub showing grass and twig imprints on one surface. Here and there the floor showed evidence of having been burned, but there was no trace whatever of a fireplace. At the base of the east wall, a small discolored area 8 inches across by 10 inches deep yielded bits of fire-hardened clay and charcoal. Fifty inches to the south, also at the base of the wall, was a similar spot 6 inches across by 8 inches deep. These, we suspect, were post holes, though the evidence is by no means conclusive. It is possible that the basin represents a small wattle-and-daub structure that was not long in use by the aborigines, but its small size and the apparent absence of a full complement of postmolds and a fireplace scarcely support the view that it may have been a lodge site.

Feature No. 2 was visible before excavation as an oblong spot of dark soil discolored by burnt earth, limestone fragments, and animal bones. Removal of the topsoil disclosed a well-marked disturbed area 9 feet by 3 feet, surrounded by sterile red-brown clay. In the south half lay a mass of limestone fragments 3 to 4 inches in diameter, many bearing evidence of exposure to fire. Beneath the stones, and apparently nearly filled by them, was a shallow basin scooped out of the subsoil to a total depth of 15 inches and a diameter of approximately 48 inches. Immediately north of the basin, the subsoil surface dipped abruptly to the floor of a pit 25 inches deep with diameters of 60 by 30 inches. There were no stones in this pit; and from the dark soil within were taken only a single shell-tempered sherd and an unworked mussel shell. No ashes were noted, nor was there any convincing evidence of fire to substantiate our first suspicion that we had uncovered an oven or roasting pit. No satisfactory explanation as to the purpose of this basin-and-pit structure presents itself, and conjecture seems pointless.

### COUNTRY CLUB SITE (14CO3)

The most promising archeological evidences seen by us on the lower Walnut, and perhaps the central feature of the once-extensive settlement in the Arkansas City locality, is a group of mounds on the property of the Arkansas City Country Club a mile east of the city and just south of the Elliott site. The group is splendidly situated on the bluffs east of, and perhaps a hundred feet above, the river; and it commands a good view up and down the valley as well as across the gently undulating uplands toward the east. The mound-topped bluff, with the tree-fringed river at its base, is a conspicuous feature of the landscape as seen from the bottoms to the west.

At present the highest point on the bluffs is occupied by the clubhouse, which overlooks the river and also, to the northward, the Elliott site and the intervening spring. Southward, along the broad gently rounded ridge, are scattered some 10 or 15 mounds. The two largest lie on the fairway a few rods due south of the clubhouse (pl. 52, *a*). They are 5 or 6 feet high and approximately 60 feet across the base. The one on the north is flat topped, and may have been graded down somewhat; otherwise both are symmetrical and are protected against erosion by a tight sod cover. The lesser mounds are in the south central and west parts of the golf course; they range from a few inches to about 3 feet in height and none is more than 30 feet across. Small sodded depressions show that some have been dug into, and one of some size has been nearly graded away. In cultivated ground south of the golf course, we identified several slight sherd- and flint-littered elevations, and subsequently we found two or three others just north of U. S. Highway 166. It is quite possible that all were once part of the Country Club group, those on the golf course owing their better preservation and relative conspicuousness to the well-kept sod cover. It need scarcely be added that the frequently used, unplowed golf course yields almost no artifacts to the surface collector.

The two large mounds were not accessible for excavation, but through the courtesy of John Boggs, president, and other high officials of the Country Club, we were permitted to work out one of the smaller elevations located in the rough near the south-central part of the golf course. This rose but a few inches above the adjacent surface, and its exact limits could not be ascertained because of its position on sloping ground. There were no signs of previous disturbance (pl. 52, *b*).

An area 35 feet square, extending well beyond the presumed edge of the mound, was staked off in 5 foot squares, and then excavated to undisturbed clay subsoil. So far as the mound itself was concerned, the results were disappointing. The profile everywhere showed a 6- to 9-inch dark-gray humus topsoil, below which lay bright red-brown clay. Flint chips, an occasional end scraper, arrowpoint, or bone fragment, and a few shell-tempered potsherds were found, all in the topsoil. Near the center of the mound area, the gray mixed soil was somewhat deeper, reaching a maximum thickness of about 15 inches. Bits of charcoal were noted, and near the southwest corner was the charred base of a 3-inch post traceable to a depth of about 18 inches. Other than this, there was no suggestion of a former structure on the spot; and the only traces of premound activities consisted of three cache pits in a line running diagonally from southeast to northwest across the cleared area. Once the cover of topsoil and midden had been stripped away, these pits showed up clearly as dark ashy circular spots filled with broken bone, stones, and other debris (fig. 68).

Pit A, at the extreme southeast edge of the mound, measured 40 inches across the top, 62 inches across the bottom, and 50 inches deep. The neck was cylindrical to a depth of nearly 2 feet, where the walls slanted gradually outward and down to the bottom. The fill, below the uppermost 11 inches, held an increasing amount of debris, particularly animal bones and stones. Horizontal strata of almost pure white ash occurred at the 35- to 37-inch level, and again at 42 to 45 inches. Artifacts occurred principally between and above the ash strata; the discovery of a puebloan glaze paint sherd at 39 inches, between the ash strata, is noteworthy. The lowest 5 inches were of hard-packed earth with very little admixture, and there was no evidence of a lining on floor or walls.

Pit B, 10 feet west and north of A, was 28 inches across the opening, 52 inches across the bottom, and 57 inches deep. Fragments of a large human skull, including part of an occiput and portions of parietal, were found at 16 inches depth, probably in the upper part of the pit. At the lower part of the cylindrical neck, 30 inches deep, was an ash layer, below which came more dark soil mixed with bones, stones, and refuse. At 42 inches to 48 inches a large flat-bottomed two-handled pot lay on its side, cracked but easily restorable (Wedel, 1942, pl. 2*a*). Beneath this was another ash layer, covering most of the pit floor, and in this lay rimsherds of two more pots and numerous fishbones. The floor was very slightly depressed at the center.

Pit C was 20 feet northwest of B. The diameter at the top was 38 inches, at the bottom 66 inches, and the depth was 63 inches. Numerous limestone fragments and broken animal bones were mixed in the hard fill near the top. Below 16 inches there was heavy ash admixture, the fill was softer, and the amount of artifacts increased. Scattered fragments of an infant skull were noted at 40 inches; and charred corn was present. There was no floor lining.

Between pits B and C was a small basin 24 inches in diameter and 19 inches deep; its significance remains uncertain.

It seems safe to conclude from our findings that the mound was primarily a midden deposit, but its exact relationship to the underlying pits is obscure. In all cases, the upper parts of the caches contained a concentration of trash noticeably greater than that in the

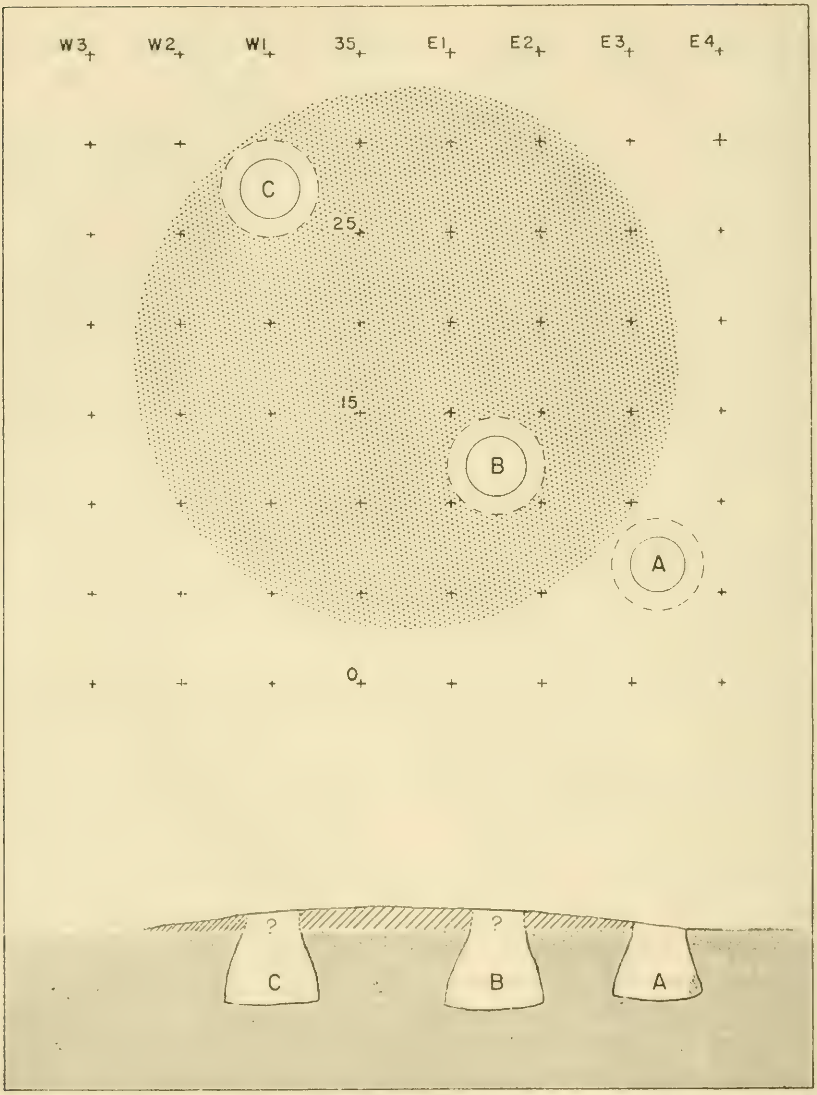

FIGURE 68.—Plan and cross section of mound 1, Arkansas City Country Club site, 14CO3. Lettered features are cache pits. Grid in 5-foot squares.

adjacent topsoil. It is quite possible therefore that the caches were dug after the mound had risen on the spot. On the other hand, it was not possible to identify the walls of the pits until subsoil was reached, and the difference in topsoil between cache mouths and mound was not striking. The possibility thus remains that the caches were actually older, and that the surface midden resulted from continued deposition of trash on the spot even after the pits were filled to overflowing. In any event, it is certain that no very great time lapse is represented, for the scanty sherds and other specimens from the mound are indistinguishable from the more plentiful materials taken out of the pits.

A widely held local view that the mounds were for burial is not substantiated by our findings. We did recover fragments of an adult skull in or over the top of pit B (depth 16 inches), and scraps of an infant skeleton in pit C, but these were not parts of orderly burials. There was not the slightest indication that the mound was or ever had been used for interment of the dead.

It would be premature, obviously, to conclude from our brief examination of one of the smallest mounds that all of those in the Cowley County group were nothing more than middens, though this may be true for most of the lesser ones. Unhappily, though there appears to have been considerable digging in the various mounds in the middle 1890's, little real information as to their internal structure or composition has been preserved. I was informed by Bert Moore of Winfield that he participated in the removal many years ago of a large mound which stood on or near the point now occupied by the clubhouse, and the University of Kansas is said to have taken part in the later stages of the work. Moore recalls that the mound was graded down with team and scraper, revealing four pits northwest, northeast, southeast, and southwest of the center. One of these contained a burial; the other three were barren. Nothing of interest was noted in the mound itself, nor are there any data as to the character of the fill or the nature of any artifacts found.

Tantalizingly inadequate, too, are the extant published accounts concerning the early excavations. Gould (1898 b, pp. 79–80) reported briefly on three of the mounds—

> which have been greatly worn down, are circular in shape, from 20 to 30 feet in diameter, and from 2 to 5 feet high in the center. At the depth of from 1 to 3 feet from the surface, fragments of charcoal began to be found; these increase with the depth, until at from 4 to 10 feet deep, the soil is in a great measure replaced by charcoal and ashes. Intermingled with this charcoal are found broken pieces of pottery. . . .

At about this same time, Dr. C. S. Acker and C. N. Hunt of Arkansas City opened one of the mounds, and Acker wrote as follows (letter of February 3, 1897: Acc. 31660) to the Smithsonian (cf. Johnson, 1897, pp. 95–96):

> In as brief a manner as possible I will relate the finding of the contents of this mound and relative position of the same. After having removed about four feet of yellow clay, we came upon a number of stones so arranged as to form a vault or small chamber, not more than 15 or 18 inches in depth; this chamber constituted a bed of ashes about 6 inches in depth. Mixed with these ashes were a few pieces of charred bone which crumbled immediately on being exposed to the atmosphere. However, some few pieces remained intact so as to be examined sufficiently to ascertain that they were human; such as part of the femur, or

> thigh bone, two vertebrae—the axis and atlas of a child. Immediately beneath the layer of ashes, and about 8 feet beneath the surface, was presented a reddish brown cement. This was several inches in thickness and rested upon what appeared to be a stone altar. This altar consisted of two large stones, peculiarly fashioned and wrought so as to represent in the position found, a basin, or, more properly, a nearly perfectly formed pelvis, with the pubic arch of same formed and fashioned so that each segment was made to meet its fellow with a nicety that seems marvelous; the body of the two stones being about 7 inches in thickness, 2 feet in length, 12 to 14 inches in width, but tapering toward the arch, the arch measuring not more than one-half inch in thickness and not to exceed more than 2 and ½ inches in breadth. From the center of the body of the stone outward to its extremity it tapered gradually by peculiarly fashioned swells and depressions toward the flaring end, or rim of the pelvis. Joined to the pelvic rim of the larger stone was found a stone somewhat smaller than the other two, crudely resembling the human heart. This whole alter was cemented firmly to a solid rock base about 3 feet square. The base, as well as the altar, was composed of native limestone. This altar seems to have been wrought to represent those portions of the human body which, at the earliest dawn of history, were considered sacred, namely, the pelvis and heart.

What I take to be another allusion to this work occurs in the following brief note in the American Anthropologist (o. s., vol. 10, No. 2, p. 57, 1897):

> On the Beavers farm, 2 miles eastward from Arkansas City, are located a number of mounds from 8 to 12 feet in height, in most of which explorations have been made from time to time. Recently, however, Drs. C. S. Acker and N. H. Hunt have conducted excavations in one of the earthworks, and have found what appears to be a sort of rude plinth of stone, on the top of which was a large urn-like vessel of earthenware. A quantity of ashes is reported to have been found in the vessel and on the stone structure, but no bones or implements were discovered.

At this late date, it may be no longer possible to reconcile and accurately appraise these several accounts. Gould seems to have been an observer of more than average ability, and his comment that the mounds were not over 5 feet high is perhaps more credible than the unsigned (anonymous) report of "mounds from 8 to 12 feet in height." If this assumption is correct, his further observation that charcoal and ashes increased to a depth of "4 to 10 feet" would imply submound features, such as caches or perhaps a basin. It is possible that the heavy ash concentrations noted by Gould, and also the four pits seen by Moore, were essentially the same sort of abandoned storage pits as were found by us beneath what we termed mound 1, and that one of these had been secondarily used for burial. As to the "plinth" or "stone altar," which terms probably refer to one and the same feature, and the "vault or small chamber," I have no valid hypothesis to offer. Perhaps some sort of special ceremonial or mortuary structure was present, though the very small quantity of human bones mentioned, casts serious doubt on the widely held local belief that the mounds were primarily for burial. There are no drawings, sketches, or other illustrations showing the relationship of the various features to one another. And, so far as may be judged from the lists of artifacts given by Gould and Johnson, there appears to have been nothing that cannot be duplicated or at least inferred from our own findings in this and nearby sites.

That great quantities of refuse and many implements in daily use by the Indians still lie beneath the sod of the Country Club site is probably a safe guess. I am far less sanguine now than at the time of our dig as to the prospects for recovery of useful information on structural features in any possible future mound exploration. In view of the apparently considerable activity of the 1890's, it is quite possible that despite their present tidy appearance the two largest remaining mounds on the fairway have already been gutted and the original constructional lines, if any, hopelessly obscured. If, by some chance, they have not been irreparably damaged, it is to be hoped that any further investigations will be entrusted to adequately trained and properly equipped persons. On the basis of our work in Rice and Cowley Counties, I find it somewhat difficult to believe that mounds of this size are nothing more than middens. It is possible that special structures once stood on these elevations, or that their interior may reveal some clues to the burial or ceremonial practices of the native society which once functioned here. Such clues, if they exist, will probably have to be pieced together from unobtrusive bits of evidence that could easily escape the inexpert hand or the untrained eye; and the story they might unfold could certainly never be more than guessed at on the basis of haphazard or piecemeal "nibbling" at the remaining mounds.

## ARTIFACTS FROM THE COWLEY COUNTY SITES

Because of the comparatively limited amount of cultural material collected in our brief survey of the locality, I have combined the artifact descriptions for all three sites in the following pages. Included are food remains, pottery, bone, chipped and ground stone, shell, and miscellaneous items. The occurrence of the various categories at each of the sites is indicated in a tabular summary (p. 378) that accompanies a brief interpretative section. This procedure seems justified in light of the very close similarity between the three sites.

### FOOD REMAINS

*Vegetal materials.*—Despite the presence of numerous scapula digging tools or "hoes," and of manos and possibly mealing slabs, direct evidence of domestic foods was exceedingly scanty. Three small charred kernels of corn were found in the test east of the old river channel at Larcom-Haggard, but elsewhere our excavations at this site yielded no positive information. A few small kernels were also found in pit A, mound 1, Country Club site. No evidence of beans, cucurbits, or sunflower was found. In spite of this generally negative evidence, I suspect that small-scale horticulture, intensively pursued, was an important aspect of the native subsistence economy, as it was among the Rice County peoples farther up the Arkansas valley.

No wild fruits, nuts, or other edible items were found, though I am confident they must have been extensively utilized.

*Bird remains.*—These were not plentiful. Bones of the wild turkey (*Meleagris gallopavo*), which must have been abundant in the locality, were found sparingly at all three sites. The black duck (*Anas rubripes*) and bald eagle (*Haliaeetus leucocephalus*) were represented by one bone each at Larcom-Haggard. Remains of the common crow (*Corvus brachyrhynchos*) were found in pits 1, 5, and 7 at the Elliott site.

*Fish remains.*—Fish bones were found very sparingly at all three stations investigated by us. From the Elliott site came bones of the catfish (*Ameiurus* sp.); the buffalo-fish (*Ictiobus* sp.) and catfish were both represented at the Country Club site; and from Larcom-Haggard there are several unidentified fish vertebrae. There can be no question, I think, that some use for food was made of the edible fish formerly so abundant in the Walnut River.

*Turtle remains.*—Bones and carapace fragments of the box turtle (*Terrapene*) were noted sparingly at all sites, particularly in the pits at Larcom-Haggard. The pond terrapin (*Pseudemys*) was indicated by bones from pits 5, 7, and 8 at the Elliott site, and also in pit A, mound 1, Country Club site. The remains of a soft-shelled turtle (*Amyda*) were identified from pit 12 at Larcom-Haggard. There was no evidence of workmanship on any of the bones or carapace fragments, and the scattered nature of the finds does not suggest stray animals that died by chance on the site. All may represent refuse from food gathering.

*Mammalian remains.*—The following species of mammals (table 13) have been identified among the animal bone returned to the United States National Museum:

TABLE 13

| Species | Larcom-Haggard (14CO1) | Elliott (14CO2) | A. C. C. C. (14CO3) | Site unknown |
|---|---|---|---|---|
| Bison (*Bison bison*) | 44 | 29 | 10 | -------- |
| Dog (*Canis familiaris*) | 56 | -------- | 1 | -------- |
| Deer, white-tailed (*Odocoileus virginianus*) | 17 | 6 | 4 | -------- |
| Rabbit, cottontail (*Silvilagus floridanus*) | 12 | -------- | -------- | -------- |
| Elk (*Cervus canadensis*) | -------- | 3 | 1 | -------- |
| Raccoon (*Procyon lotor*) | -------- | -------- | -------- | 1 |
| Ground squirrel (*Citellus*) | -------- | 1 | 1 | -------- |
| Pocket gopher (*Geomys*) | -------- | 2 | -------- | -------- |
| Unidentified | -------- | 2 | 2 | -------- |

That bison were the principal source of meat in these communities is fairly certain, I believe, because most of the bone scrap and splinters we discarded in the field as unidentifiable undoubtedly came from large heavy mammals, in all likelihood bison. The abundance of deer bones probably reflects the nearness of oak scrub and dense woods downriver from the sites; and elk should have been fairly plentiful at the woodland margins and on the nearby prairies. It may be suggested that the faunal list, short though it is, nevertheless is in line with what might be expected from the situation of the Cowley County sites at the edge of the deciduous forest and prairie zone.

The dog remains, though mostly fragmentary, suggest fair-sized to large animals, perhaps about the size of a collie or foxhound. The relatively large number of bones indicated for the Larcom-Haggard site is somewhat misleading, since 33 of these are very likely from a single individual.

### POTTERY

The present discussion is based on a series of about 1,300 sherds and 4 restored vessels. With exception of about 30 sherds, all of this material belongs to a single ware for which the name Cowley Plain is proposed. The paste is generally fine in texture, and tends to be laminated or flaky in sherd cross section. Inclusions consist of medium to finely flaked shell particles, sparingly to abundantly used; leaching of the shell sometimes produces characteristic flat angular porosities in the vessel wall or shallow pittings on the surface. Hardness varies from 2 to 4, most of the sherds being relatively soft and "chalky" to the touch. Color is buff, brownish, or gray on the surface; the core is usually slate gray, and light-colored sherds may show firing clouds on the exterior surface. Exterior surfaces are smoothed but rarely show any attempt at polishing; interiors are bumpy and uneven, and reflect little care in their finishing.

Vessel forms include both jars and deep bowls (pls. 53, 54; fig. 69). The jars are ovate, rarely globular, in vertical profile, with a flattened circular or rarely rounded base, a rounded shoulder and constricted neck; they range in height from 19.5 to 28 cm., in maximum diameter from 17.5 to 26.6 cm., and the walls vary from 4 to 20 mm. (average 5 to 7 mm.) in thickness.[34] Rims are simple, unthickened, either straight and vertical or slightly recurved and flaring, from 2 to 7 cm. high. Lips are usually rounded, rarely flattened or slightly everted. Appendages consist of vertically set loop or strap handles, 2 per vessel, attached at and just above the shoulder and below the lip, commonly by riveting, and with small rounded nipplelike or laterally flattened nodes at the lower, or at lower and upper, angles

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[34] These dimensions are from restored specimens; larger vessels undoubtedly were in use.

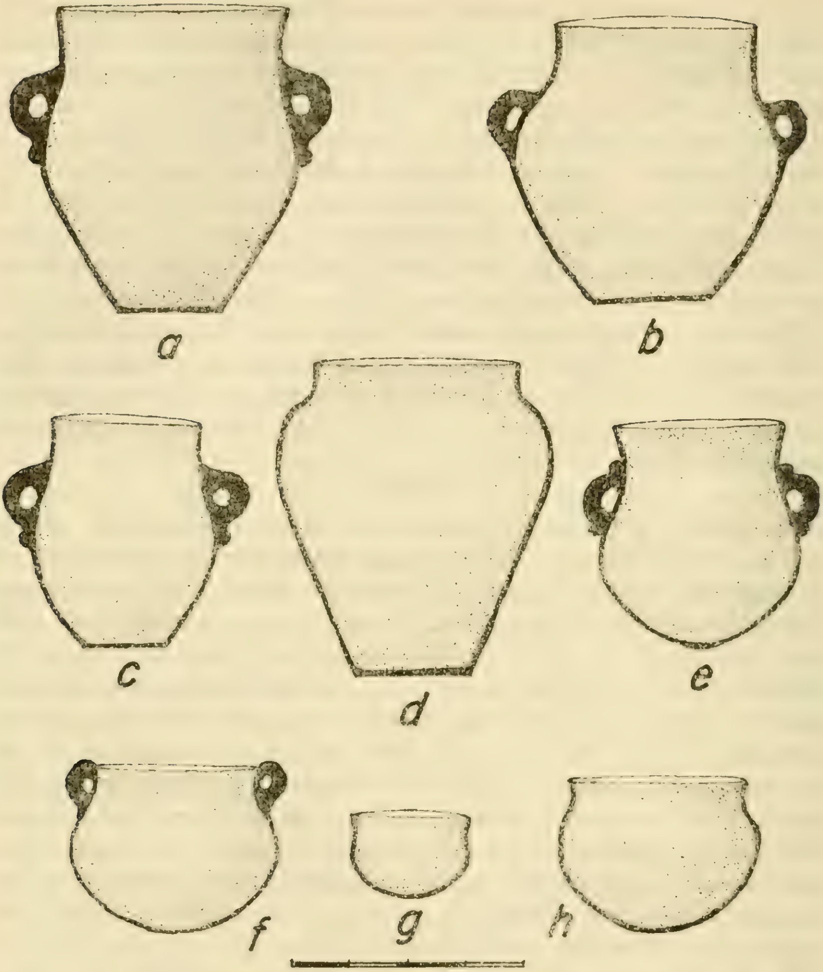

FIGURE 69.—Vessel shapes, type Cowley Plain, from Larcom-Haggard (14CO1) site. Scale, 20 cm.

of attachment. Decoration is exceedingly rare; one loop handle has a row of circular punctations running down the midline, and 21 of approximately 75 lip sherds have diagonal incisions, the rest being undecorated. There are four incised sherds from Larcom-Haggard, but these even apart from the decoration cannot be certainly assigned to the ware under discussion.[35]

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[35] This description is based on 3 restored jars from pit B, mound 1, Country Club site, and 1 from pit 8, Elliott site. Shortly after we left the locality, Louis Essex of Arkansas City opened a cache pit just southeast of, but probably a part of, the Larcom-Haggard site; and from sherds sent by him to the National Museum for study two more vessels were assembled (pl. 54). Both are shell tempered, have flat disk bases, vertical strap handles, and shapes not significantly deviant from those represented by our finds. The larger of these (pl. 54, *a*) is 31.8 cm. high by 26.3 cm. in greatest diameter, with a 10-cm. base; the second (pl. 54, *b*) has corresponding measurements of 17.8, 16.8, and 7.6 cm.

No whole or restorable bowls were found, but their presence is inferred from sizable sherds whose horizontal and vertical curvatures have been projected. Assuming that these projections are reasonably accurate, they indicate relatively deep round-bottomed and round-shouldered bowls with low recurved or slightly flaring rims below which the vessel is somewhat constricted (fig. 69). Body diameter is estimated at 11.5 to 19 cm., exterior rim diameter at 11.5 to 16 cm. and height at 8 to 15 cm. The largest example, from pit 14 at Larcom-Haggard, was provided with strap handles rising from the lip and attached below the neck apparently by riveting. All had plain lips and were undecorated.

There is nothing in our sherd samples, as summarized in table 15 (p. 378), that would modify the above characterization based on restored jars and bowls. All three stations yielded loop and strap handles, evidence of riveting and angle nodes associated with these, flat disk base sherds, plain rounded as well as diagonally incised lips, and an overwhelming preponderance of plain shell-tempered sherds. There is, of course, some variation in the incidence of these items from site to site, but this is to be expected in a series of small unequal samples such as we have. Sand-tempered sherds occurred very sparingly in all three sites, but redware possibly of Geneseo Red Filmed type was represented by only two sherds, both from the Country Club site.

Granted the essential sameness of the pottery from the three Cowley County sites, we may note briefly the resemblances and differences between this material and the graywares previously described from Rice County. The most striking dissimilarity, of course, is in regard to tempering; the Cowley County ware is over 99 percent shell tempered, whereas the Rice County graywares are about 95 percent sand tempered. In vessel shapes there is a close basic resemblance, particularly between Cowley Plain and Geneseo Plain; both feature jars ovate in vertical profile, and in both occur flat bases, riveted handles set between rim and shoulder, and simple unthickened vertical or slightly flaring rims. Flat disk bases and handles, however, are relatively much less plentiful in the Rice County graywares; in more than 7,000 sherds from the Tobias,

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They bear out our belief that the Larcom-Haggard jar forms were essentially identical with those found at the other two sites.

A faded photograph (cat. No. 173705) in the Division of Archeology, U. S. National Museum, shows a flat-bottomed jar with handles, evidently the urn found by Acker and Hunt in 1897, on the present Country Club property. The accompanying letter (U. S. N. M. Acc. 31660) from Dr. Acker, dated February 3, 1897, states that the pot was 10 feet north of the altar, 9 feet below the mound surface, and 2 feet beneath a 6-inch layer of ashes. Its height is given as 12⅛ inches (30.8 cm.), maximum circumference as 37 inches (diam. ca. 30 cm.), circumference of neck as 27½ inches (diam. ca. 22 cm.), circumference at base as 19½ inches (diam. ca. 13 cm.), thickness of walls as 3/16 to ¼ inch (5–7 mm.); tempering is shell. Its close relationship to our material is obvious.

Thompson, and Malone sites there are but 4 flat disk bases, 33 loop handles, and 23 strap handles, whereas the approximately 1,300 Cowley Plain sherds include 31 flat disk bases, 26 loop handles, and 13 strap handles (fig. 70). The restored vessels from the two districts thus definitely reflect an actual difference in these particulars (cf. fig. 69 and pl. 53 with fig. 39 and pls. 26–29). The Geneseo Simple Stamped vessel profile, to judge again from restored jars, diverges yet further from Cowley Plain in its consistently more rounded base, its proportionately higher rims, and its apparently greater scarcity of handles. Unlike the Cowley County material, too, that from Rice County has not yielded definite evidence of bowls or bowllike forms, but I suspect that a more painstaking search might yet uncover such pieces.

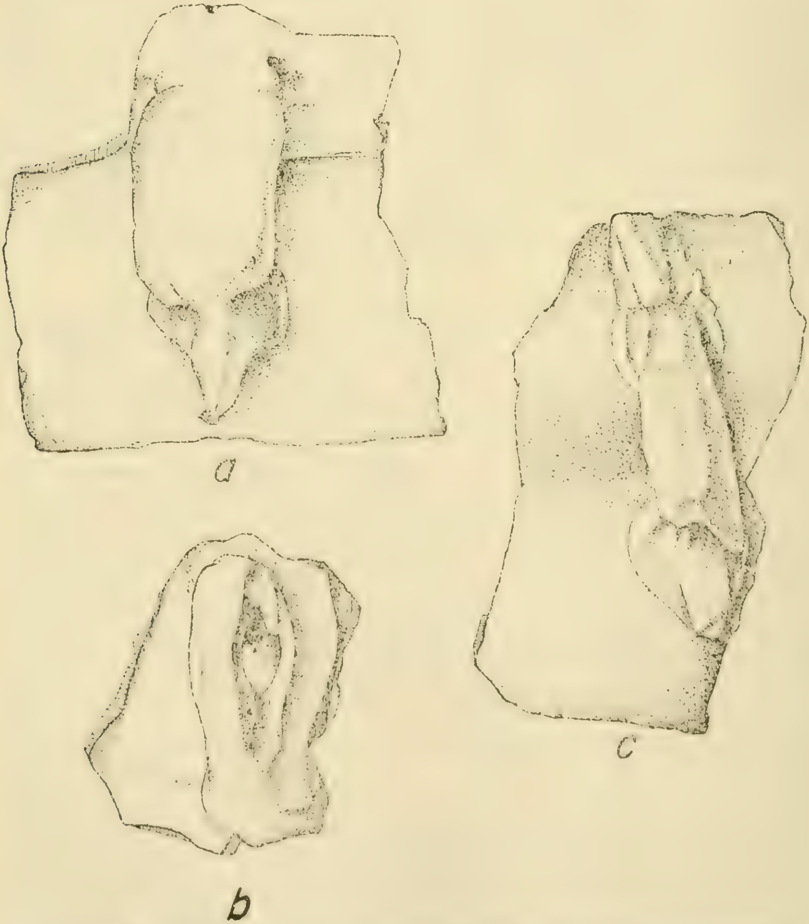

FIGURE 70.—Pottery handles, type Cowley Plain, from Larcom-Haggard site.

### EXOTIC WARES

Whether the very few incised sherds from the Cowley County sites, and certain others differing markedly from Cowley Plain in surface finish and paste, represent local products is not clear; if not locally made, their source is still undetermined. Other clearly nonlocal pieces can be identified with some assurance, and so offer clues to the wider trade or other relationships between the Cowley County Indians and their remote contemporaries.

Four glaze-paint decorated sherds were found at the Larcom-Haggard site; two came from pit 14, one from a depth of 14 inches in midden 17, and one from the surface. A fifth sherd was found in pit A, mound 1, of the Country Club site. All five (pl. 49, *c*, *h–j*) were submitted to Mera who commented (letter of Aug. 30, 1943) as follows:

> The five sherds from the Cowley County sites have been examined and as you suspected are of the same type as the larger group of glaze-paint sherds (11 specimens) from Rice County. Although no rims were present in your lot, the carinated sherd [from the Country Club site] proved valuable in fixing the style and period, the remaining four agreeing nicely with it in character of paint and paste. Therefore, a time interval, circa 1525–1650, is indicated.

Possible contacts in another direction are indicated by three sherds from pit 2, Larcom-Haggard site. They are of very dark gray ware, thickly tempered with finely crushed shell, and have rows of closely set vertical fingernail indentations (fig. 71, *b*); one sherd shows a plain rounded lip. The vessel from which these pieces came was markedly unlike the local ware, and the massed fingernail indentations resemble nothing with which I am familiar in the Central Plains. The treatment is reminiscent of that on certain vessels from southwest Arkansas (Harrington, 1920, pl. 57, a, 67, b), and also, according to Willey, of that on sherds of Wilkinson Punctated from Louisiana (Ford and Willey, 1940, p. 50); whether, and to what extent, it occurs in the Arkansas basin of eastern Oklahoma I am not prepared to say.

Additional evidence of downriver contacts is seen in several sherds collected by Louis Essex in one of a group of cache pits elsewhere noted southeast of the Larcom-Haggard site. These fragments, directly associated with sherds of local ware, were reassembled at the National Museum and photographed before return to their finder. They include part of the lip and wall of a deep bowl. The ware is hard, well-fired, and has a polished exterior; the design (pl. 49, *k*) has been cut after firing. The upper rim, detached at time of uncovering, has been fire blackened. No other examples of this post-firing incising were found during our work in Cowley County, and the pieces are clearly of exotic origin.

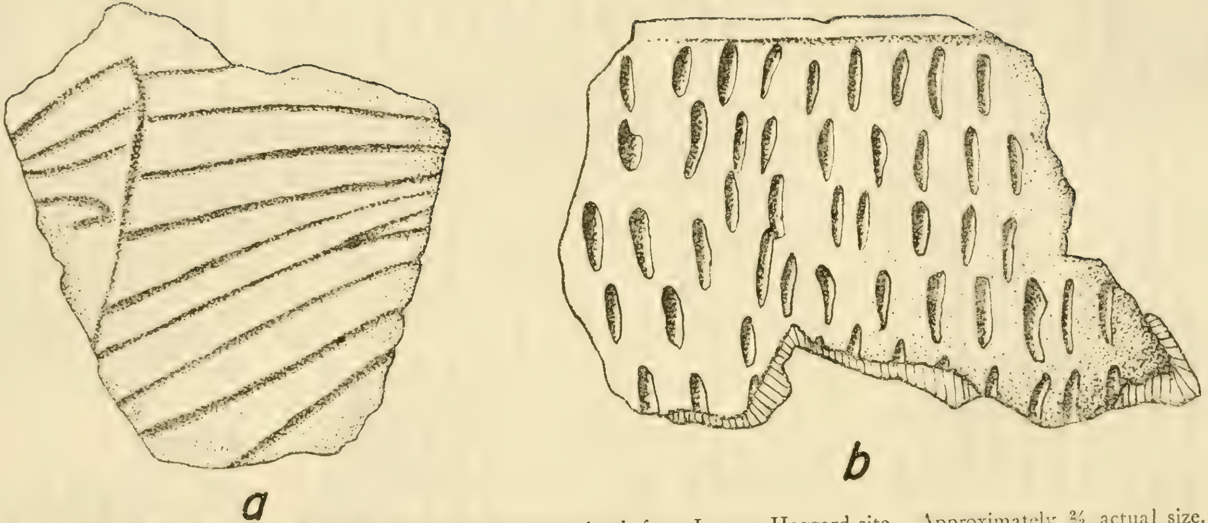

Figure 71.—*a*, Trailed sherd, from Elliott site; *b*, punctate sherd, from Larcom-Haggard site. Approximately ⅔ actual size.

These specimens were seen by Alex Krieger in 1944. He has since (Krieger, 1946, p. 151 fn. 62) indicated that "they belong to the type Avery Engraved of Texarkana Focus, a type sometimes red-filmed or shell-tempered, or both. . . ." The circumstances of their discovery leave little room for doubt that they were carried into the Arkansas City locality in Indian days; and their association with the local pottery type Cowley Plain in a site that also yielded Rio Grande glaze paint sherds is of much more than passing interest because of the chronological implications.

### ARTIFACTS OF BONE

*Bison scapula digging tools.*—Far outnumbering all other bone artifacts from the sites were numerous large and small fragments and incomplete specimens of digging tools. A particularly instructive series came from pit 4A, Larcom-Haggard, one of a group of three overlapping caches, where 19 more or less complete specimens lay together at a depth of 44 inches underground. They varied from short stubby square- or slightly concave-bladed implements 20 cm. long up to large round-bladed forms as much as 38 cm. long. The scapular spine and other excrescences have generally been cleanly removed, as though by a metal saw. In a very few instances the head of the scapula, i. e., the glenoid fossa, has been removed or else its edges have been partially or wholly reduced. In every instance where enough of this end of the bone remains for examination, there is a deep groove running from the glenoid fossa 7 to 12 cm. down the dorsal surface of the bone. Five scapula heads from the Country Club site have deep circular or subcircular sockets bored from the glenoid fossa into the neck of the bone (pl. 55, *f*, *g*); and an equal number from the Elliott site have either a socket or groove in this position. The sockets are 5 to 9 cm. deep. One socketed scapula head from pit 14, Larcom-Haggard, has the edges of the socket fire blackened (pl. 55, *g*). In general, of course, the digging tools do not differ significantly from those at other Plains sites of several time levels; but in the boring or grooving of the head and the probable manner of hafting they, along with the similarly treated Rice County specimens, are unlike the usual Central Plains forms.

From pit 7 at Larcom-Haggard was taken a broken scapula tool with an irregular elliptical hole 28 by 18 mm. hacked through the neck about 6 cm. below the edge of the glenoid fossa. The hole shows no signs of wear, and its purpose is unknown. There is only one specimen so treated.

*Awls.*—The characteristic form of awl was that fashioned from the anterior margin of the neural spine of the bison, with a triangular cross section, a rounded butt, and traces of cancellous tissue along one flat surface. Length of the complete examples was from

64 to 129 mm. Sixteen of twenty-one awls from the sites were of this type, which occurred predominantly or exclusively at all three sites (pl. 56, *a-c*).

Five awls were made of split mammal leg bone: in three the head had been partly worked down after splitting, in one it had been entirely removed, and the fifth specimen was incomplete. These awls, to judge by complete specimens, average somewhat longer than the preceding, with lengths of 11 to 16 cm. (pl. 56, *d-g*).

*Shaft straighteners.*—There are two of these (pl. 36, *b*, *c*), both from pit 5, Elliott site, and both differing from the usual perforated bison-rib type in being made from the tibia of the mule deer (*Odocoileus hemionus*). In each case the proximal end of the bone has been detached by sawing partly through the wall all around and then snapping off the head, very raggedly in the smaller specimen. Near the distal end of the larger bone, a hole 8 mm. in diameter has been neatly bored through the shaft; its edges show little or no abrasion. The smaller bone, obviously from a young animal, has an elliptical perforation 4.5 cm. from the distal end; the hole measures 8 by 13 mm., shows pronounced wear facets at either end parallel to the long axis of the piece, and is partly broken out on the posterior surface of the bone. The shaft surface above the perforation on the larger bone is well worn, that on the second piece less so, and when in use they were obviously grasped at that point with the unworked distal end pointed up or out. They measure 18.5 and 16.7 cm. in length.

*Scored implements.*—Fragmentary examples of these occurred at all three sites; all were made of bison rib. The fragments varied in length from 21 to 175 mm., and had from 6 to 25 transverse cuts across the convex outer surface of the bone. In every case the scorings reached to one or both ends of the piece, and the marked surfaces must therefore have been originally of greater, but undeterminable, length. Generally the scorings appear to have been continuous, though one piece from pit 7, Elliott site, has them in blocks of 5 or 6 alternating with unscored blocks. There is considerable variation in the specimens in regard to regularity, boldness, and spacing of the grooves, which range from 1½ to nearly 4 per centimeter. A few show some wear along the midline, but most do not, and their identification as musical rasps seems questionable to me.

*Cancellous bone implements.*—From pit 3, Larcom-Haggard site, came a flat subtriangular piece of dressed porous bone, with two smoothed surfaces and a thinned curving edge 2 to 3 mm. thick. Maximum thickness opposite the curved edge is 7 mm. There can be little doubt, I think, that this was part of one of the wedge-shaped paint applicators so widely used in historic and protohistoric times by the Plains tribes (pl. 35, *h*).

From pit 7, Elliott site, was taken a small round flattened object of porous bone, measuring 22 by 28 mm. Its purpose is unknown.

*Tubular beads.*—These were not common, though they occurred at all three sites. All were made of thin hollow bones, presumably of birds, are plain and undecorated though commonly polished from use, and vary from straight to slightly curved. They are from just under 3 to nearly 9 mm. in diameter, by 12 to nearly 57 mm. long, with length from 2½ to 20 times the diameter. In all respects, they thus resemble the much more numerous beads from Rice County.

*Ring beads.*—Two specimens from pit 12, Larcom-Haggard, have a diameter of 6.5 mm. and a length of 5 to 7 mm. Both are highly polished from use.

*Tube.*—From pit 7, Elliott site, was taken a short thick tube cut from near the end of a turkey humerus; it is 38 mm. long by 16 to 20 mm. in diameter, and still bears longitudinal working striae.

*Miscellaneous bone objects.*—This group includes from the Larcom-Haggard site a 67-mm. section of mammal leg bone, with one end shattered, the other cut and snapped off and then rubbed smooth; and three light hollow bones split lengthwise and cut at one end, with deep longitudinal striae suggesting further abortive attempts at splitting off long narrow slips of bone for needles or similar delicate objects.

From pit 8 at the Elliott site came a thin sliver of bone with dressed edges, rounded butt, and a rodent-chewed tip; it is 102 by 6 by 3 mm., and somewhat suggests a needle except that it lacks the eye. The distal extremity of a turkey tibiotarsus from pit 7, cut and snapped off, doubtless represents rejectage from bead manufacture.

From the Country Club site there is a slender tapered pinlike fragment 32 mm. long, with both ends broken off; and a larger smoothed and curved section of the same length, with elliptical cross section 3 by 4 mm., also broken at the ends.

### OBJECTS OF CHIPPED STONE

These were present in considerable number and variety at all three Cowley County sites. With respect to materials, techniques, and forms, they parallel closely the Rice County finds, except that certain rare types in the north were not found by us in the Arkansas City district. The local flint workers drew heavily on the banded pinkish to grayish fossiliferous cherts of the Maple City, Kansas and Hardy, Oklahoma area, which lies not more than 15 or 20 miles to the east, and they used the stone far more freely than did their northern contemporaries to whom the material was less easily available. Blue-gray fossiliferous cherts were also employed, but less commonly. There are few objects or chips of jasper, chalcedony, and moss agate. Obsidian is represented by six flakes; three are from the surface of the

Larcom-Haggard site, and two are from the surface and one from pit 5 of the Elliott site.

*Projectile points.*—The most common form of projectile point at all three sites is the simple unnotched triangle, with straight or slightly concave base, straight or slightly convex edges, a thin biconvex cross section, and good to excellent bifacial retouching. Length is 14 to 40 mm., width 9 to 20 mm., and thickness 1.5 to 4 mm. These points constitute from 59 to 80 percent of those from each site.

Much less plentiful are points with the same basic form and size, but with a pair of small notches 3 to 7 mm. above the base. All notched points from Larcom-Haggard are incomplete, but at least two had a third notch in the base.

From Larcom-Haggard and also from Elliott were taken a number of crudely made points approximating the simple triangle or a leaf shape and lacking any notches. Some are curved or "twisted," and retouching is commonly restricted to one face or to one face and the edges of the other. They are much inferior in workmanship to the preceding forms. They measure 24 to 34 mm. long, 12 to 21 mm. wide, and 3 to 5 mm. thick.

An unusual form from the Country Club site has a thick subtriangular blade, two broad notches, and a rounded stem with convex base. Measuring 46 by 20 by 5 mm., it is much more rudely made, as well as heavier, than the common types noted above.

*Drills.*—Thirty-two specimens are included here, but many are fragmentary and resist classification on the basis of form. Large plain-shafted or "pipe" drills (p. 267) are certainly in the minority; they are represented by tip and butt fragments only from the Elliott and Country Club sites, and by a whole specimen from midden 15 at Larcom-Haggard. The latter measures 90 by 10 by 7 mm., has a thick diamond-shaped cross section, and, like the fragments from the other two sites, has the long edges blunted from long hard use (fig. 72, *c*).

There are three specimens, two from Elliott and one from Country Club, in which the drill shaft widens gradually to a flange or expanded base. The points are slender and delicate, from 15 to 23 mm. long; overall length is 41 to 52 mm., and the expanded base is usually retouched little or not at all.

Most common at Larcom-Haggard and Elliott, and represented by a single specimen at Country Club, are drills with slender shafts and large abruptly widening basal flanges. The shafts are 8 to 25 mm. long, with diamond-shaped cross section and careful retouching; the basal flange is irregular and variable in size and shape, rarely with the edges partially or entirely retouched. Overall length is 22 to 60 mm., and width of the basal flange is 22 to 46 mm. The edges of the drill shaft never show the pronounced blunting seen on the larger plain-

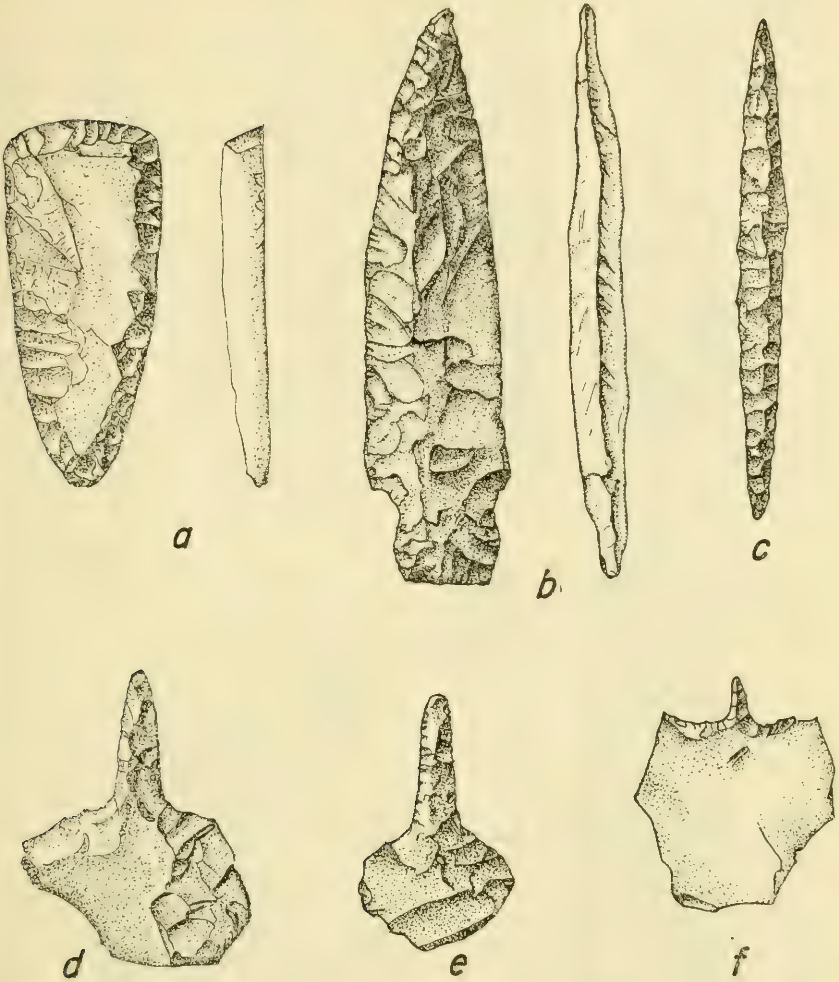

FIGURE 72.—*a*, End scraper; *b*, stemmed knife; *c*, straight-shafted drill; *d–f*, expanded base drills, from Larcom-Haggard site.

shafted specimens; and I believe that here, as in Rice County, the expanded base drills were used for lighter work on softer materials (fig. 72, *d–f*).

*Knives with unbeveled edges.*—From all sites came mid- and end-sections of relatively thin broad bifacially retouched implements that are presumed to have been used for cutting purposes. Complete specimens are exceedingly rare, and the rate of breakage must have been very high. From the available end fragments, I would guess that large elliptic, broadly lunate, and oval forms were present, less probably perhaps elongate or lanceolate pieces with one end or both pointed. The nearest approach to a complete example (fig. 73, *d*), is from pit 5,

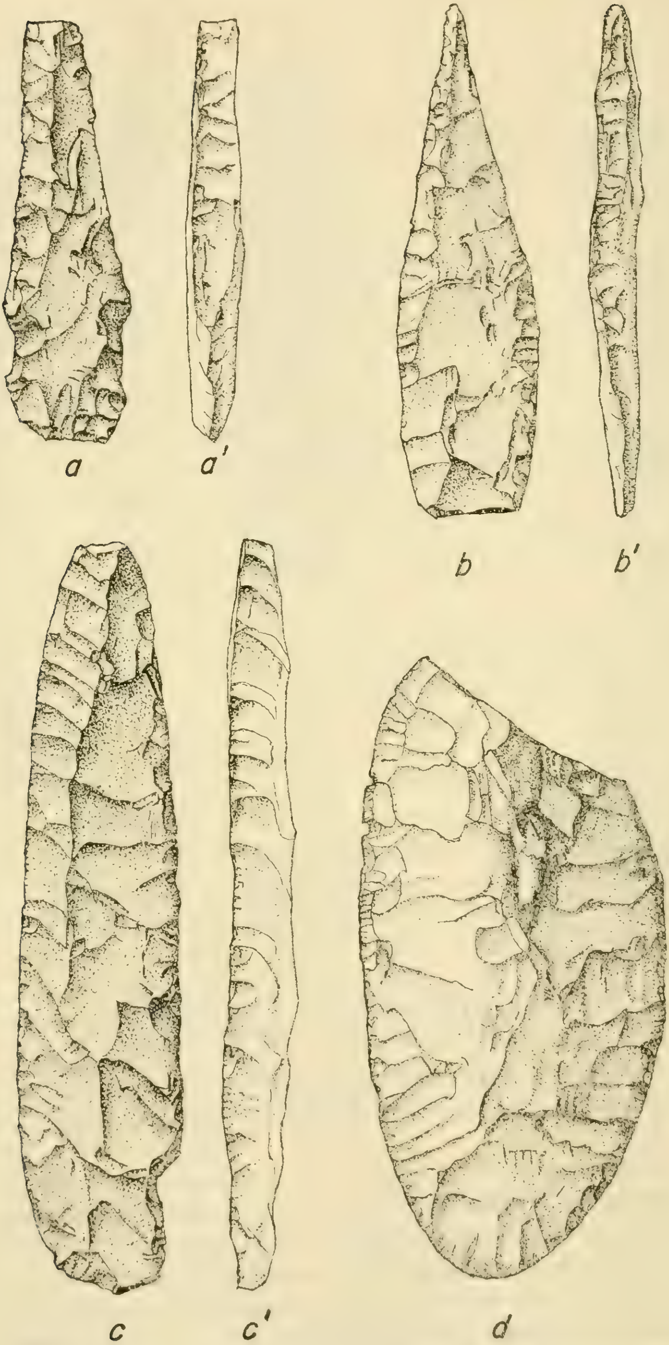

FIGURE 73.—*a*, *b*, Beveled knives; *c*, *d*, unbeveled knives, from Elliott site.

Elliott site; it is of banded fusulinid chert, 12 mm. thick, 65 mm. wide, and, if symmetrical, had an original length of 135 to 140 mm. A number of other sizable fragments, similarly well worked, closely approximate the contours of corresponding parts of this specimen and suggest that the type may have been a common one.

*Knives with beveled edges.*—These were about as numerous as the preceding group, to judge by the number of fragments, and breakage seems to have been rather less. That some, at least, were intended for hafting is indicated by the presence of notched and/or stemmed pieces. In these, maximum width was usually just above the notches or shoulders, whence the oppositely beveled convex, straight, or concave blade edges taper to a point. The base is either rounded or straight, and the blade always has a rhomboidal cross section. Our sample from the Cowley County sites is much smaller than that from Rice County, but it indicates that substantially the same forms or varieties were in use in both localities. All of the Cowley County pieces which still show the base can be duplicated from the Tobias site and neighboring stations (fig. 73, *a*, *b*).

Among the numerous and somewhat varied beveled blade fragments from Cowley County it should be noted that all, when held with the smaller (tip) end up, show the beveling on the left edge. This likewise tallies with the Rice County findings.

Some of the broken pieces may have been originally 4 edged, since they suggest a change in the direction of bevel at the broadest part of the blade. There are, however, no complete 4-edged or diamond-shaped knives in our series, and I cannot say whether this, the so-called "Harahey" form, was known to, or in use among, the local Indian population. If it was, it must have been relatively uncommon by comparison with the notched and stemmed 2-edged forms.

*End scrapers.*—Planoconvex end scrapers, usually ovate in outline, were found at all three sites. In most the long edges were rubbed down, but the broad rounded end was sharp and unworn. They varied in length from 21 to 70 mm., but at every site approximately two-thirds were under 38 mm. long. They conform in all particulars to those from Rice County.

*Side scrapers.*—Irregular spalls of various sizes and shapes with one, or rarely more, edge retouched from one side only, were also present everywhere. Except in the matter of retouched edges, they differed in no respect from hundreds of other spalls and "rejects." They were found rather less commonly at the Elliott site, where fragments of bifacially retouched and shaped knives were more plentiful (fig. 74, *a*, *b*,).

*Chopping tools.*—Thick, rudely shaped and coarsely chipped subelliptic to subovate objects, occasionally notched and with battered edges, were presumably hafted and used as axes. Similar unnotched

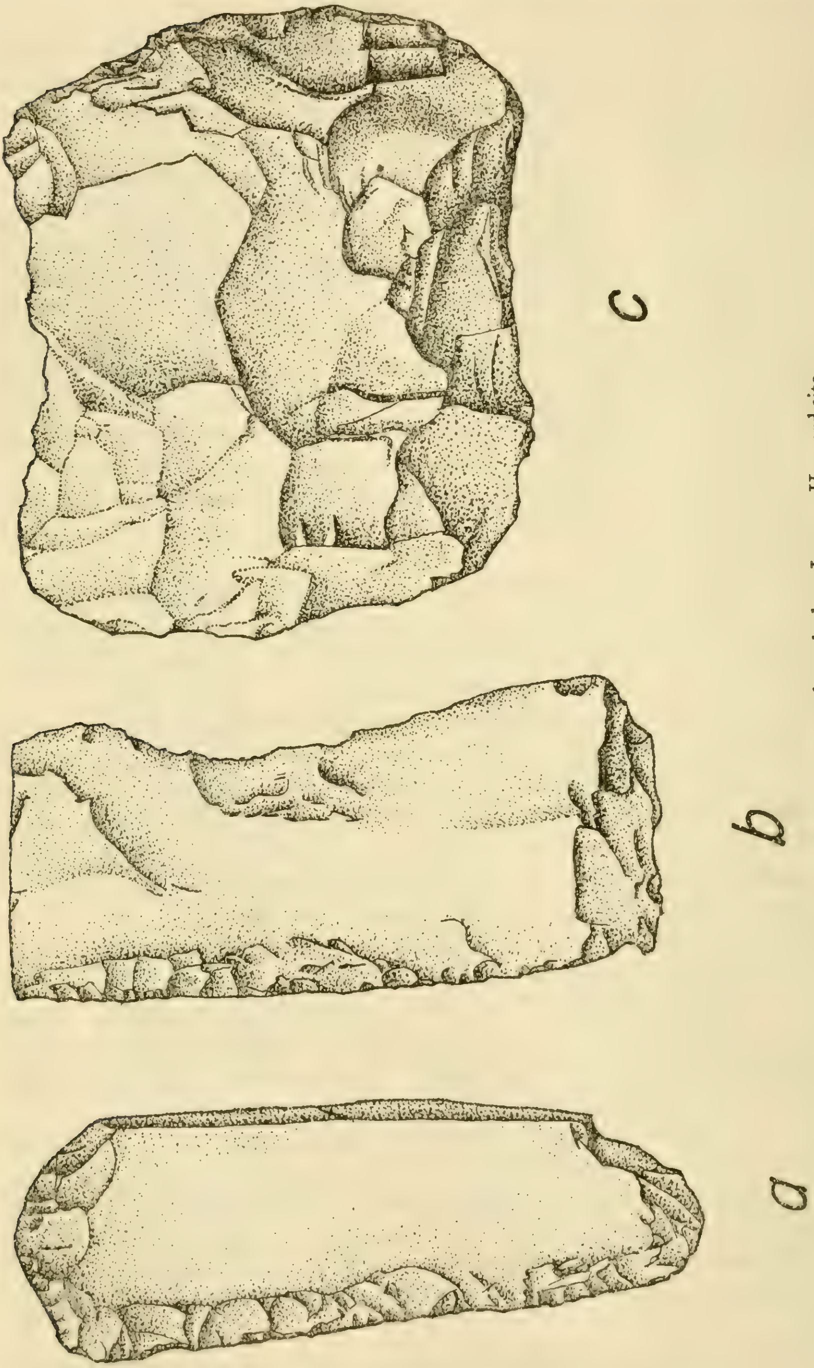

FIGURE 74.—Side scrapers and notched ax, Larcom-Haggard site.

pieces also occur, but whether these represent unfinished examples or were used in different fashion I do not know. Little care was devoted to the shaping and finishing of these tools, but their size and the battered edges indicate that they saw heavy service. They range from small specimens 65 mm. in greatest dimension to a large piece 225 by 105 by 65 mm., and were found, though in small numbers, at all three sites (fig. 74, *c;* pl. 56, *l, m*).

### OBJECTS OF GROUND AND PECKED STONE

*Mealing slab.*—A single small fragment of worked limestone from the Country Club site is tentatively identified as from the slightly raised edge of a troughed metate. The slab appears to have been 6 to 8 cm. thick, and the presumed upper surface is smoothed. The original size and shape of the implement is unknown.

*Manos.*—Manos or handstones occurred at all three sites, suggesting that the metate-mano complex was much more common than the single mealing slab (?) fragment noted above would indicate. From our comparatively small series of manos it would appear that the prevalent form was elongate elliptical with rounded ends and planoconvex cross section; the thick subrectangular type with rounded corners was much scarcer. None of the specimens has more than one grinding surface. With one or two exceptions of sandstone, all are of gritty, often fossiliferous, limestone of local origin. Complete specimens are 105 to 292 mm. long, 84 to 95 mm. wide, and 32 to 65 mm. thick.

*Grooved mauls.*—Three more or less complete mauls, one from each site, were found, as well as a spall possibly representing a fourth. That from Larcom-Haggard (pit 4) has convex sides, moderately convex striking surfaces, and a well-defined median encircling groove; it is of fossiliferous limestone, measures 129 by 106 mm., and weighs 74 ounces. From the Elliott site came another of sandy limestone, with subrectangular convex striking surfaces, straight to slightly convex sides, and a deep groove; it measures 128 by 105 mm. The one from the Country Club site is badly battered, with one poll almost entirely spalled away; it apparently once had straight sides, an oval cross section, and a low-flanged groove, with measurements of 105 by 90 mm., and a weight of 44 ounces. The material is quartzite or very hard sandstone. None of these three was as well made or as asymmetrical as the finest quartzite specimens from Rice County. A spall, found with the Country Club maul in pit B, mound 1, is wedge shaped, and shows part of a flat surface separated by a curving edge from a carefully dressed convex and curving surface. Of red quartzite it may possibly represent one of the better-made forms like those at the Tobias site.

*Shaft smoothers.*—There is but a single complete example of the shaped rectangular longitudinally grooved shaft smoother, but fragments evidently of the same type were found at all three sites. The complete specimen, from pit A, mound 1, Country Club site, is 102 by 22 by 24 mm. The material, in all cases, is a dark-brown Dakota sandstone. In all respects, these fragments and the whole piece, are like those from Rice County.

*Sharpening blocks.*—These are small irregular pieces of sandstone, and in some instances re-used fragments of shaft smoothers, whose surface has short narrow grooves unsuited to shaft smoothing and probably resulting from the shaping of awls, needles, and similar small pointed objects. They occurred at all sites.

*Shaft polisher* (?).—This term is used to designate provisionally an irregular worked limestone block from pit 8, Elliott site. One surface has been flattened by scraping, and is deeply striated from this process; across it run two grooves, each about 10 mm. wide by 4 mm. deep and deeply striated, and separated from each other by a narrow residual ridge. The grooves are somewhat angular in cross section, and do not show the polish or smoothing that would result from drawing a shaft or rod through them. They are, however, of approximately the right size to accommodate such an object, and I suspect represent an unfinished buffing tool. I can suggest no other likely use for it.

*Rectanguloid block.*—This is a carefully shaped, subrectangular object, with dressed convex edges and smoothed convex surfaces, closely approximating in form a small pillow or cushion. One surface has marks somewhat suggesting wear from a thong, and on one edge is a pecked fingerhole. It is of dark-gray sandstone, and measures 178 by 116 by 39 mm. There is nothing to suggest its manner of use; it is much more carefully shaped than a mano and cannot be so considered. It was found in a test east of the old Walnut River channel at the Larcom-Haggard site.

*Pipes.*—There are, unfortunately, no whole pipes in our Cowley County collections, and the fragments found, though suggestive, are mostly inconclusive regarding the original form and size of the objects. From mound 1, Country Club site, came part of a bowl and short right-angled stem from a small split pipe of soft crinoidal limestone. The bowl seems to have been rather low and bulbous, but precise reconstruction is impossible.

Fragments from the upper rim portion of two pipes were found at the Elliott site. One, from pit 5, is of catlinite, and seems to have been part of a tall somewhat bulbous bowl; the interior is smoke blackened. About 2.5 mm. below the lip is an encircling groove, between which and the lip are faintly incised single chevrons, pointing alternately up and down. The piece conforms closely in size and contours to the upper bowl of the L-shaped catlinite pipes from Rice County, and possibly is from one of that type, but of this I cannot be certain. The second piece, from pit 7, is of soft gray limestone, and is much heavier than the preceding. Below the lip, two deep close-set grooves apparently encircled the bowl. The cavity is about 15 mm. across, and the bowl was at least 25 to 28 mm. in diameter. There are many tiny fragments belonging to this piece, all indicating a thick-walled pipe; but, as with the catlinite specimen above, proof of an elbow shape is wanting.

A fragment of thick-walled stone tube was also taken from pit 7, Elliott site. There are longitudinal working striae on the external surface, as also on the bored cavity. Thickness is about 11 mm. The specimen suggests the thick-walled tubular pipes from Rice County. There is no smoke blackening, but the piece may never have been completed or used.

*Celts.*—Two basalt celts were found in pit 7, Elliott site (pl. 56, *h*, *i*). The smaller has a nearly circular cross section, a rounded butt, and a thick blade with slightly curved working edge. Most of the surface shows the "dimpled" texturing of the hammer-pecking, except where grinding of the edge has nearly obliterated this. The larger specimen is less symmetrical, slightly thicker than wide, with a narrower blade. Both are slightly chipped at the ends. They measure 140 by 48 by 45 mm. and 160 by 45 by 46 mm., respectively.

To the best of my knowledge these are the only celts so far known from the three sites we worked in Cowley County, and I recall no instance of their occurrence in the Rice County sites. This extreme scarcity, or virtual absence, of the type suggests that the present pieces were not typical and may have been acquired, by trade or otherwise, from another group, perhaps to the southeast.

*Cupstone.*—This is an irregular chunk of fossiliferous limestone bearing on its upper surface 3 or 4 small hemispheric pits or depressions. Best marked of the pits is a symmetrical one 25 to 28 mm. in diameter by 7 to 8 mm. deep; the others are smaller, and are scattered at random over the surface. The stone measures about 160 by 90 by 75 mm.; it is from the excavations at the Country Club site.

### UNWORKED STONE; PIGMENTS

In addition to the stone artifacts, there were many fire-cracked stones and stream-worn boulders of varied sizes and shapes in all of the sites. The former may have been used in cooking, as pot rests, or for other purposes connected with culinary pursuits. Some of the stream-worn boulders could have been used, with little or no modification, as mullers, rubbing stones, hammerstones, and for other similar purposes. No attempt was made to collect any of these specimens, or to note specifically their size and other characteristics.

Pigments include four lumps of hematite from the Larcom-Haggard site. All are small and show flat striated facets where red powder was ground off. Two are soft and friable; the others are hard and compact.

### OBJECTS OF SHELL

About 100 or more shells of fresh-water mussels, most of them unworked, were collected from the three Cowley County sites. All are of species presumed to be, or formerly to have been, obtainable in the nearby Walnut and Arkansas Rivers. Of the species identified from the sites, only three are represented by artifacts. Whether the rest constitute refuse from the gathering of shellfish for food is conjectural, but it is probable that the burned shell used in pottery tempering came in large measure from these local species. Table 14 lists the species identified, with the number of shells from each site, and indicates by an asterisk the ones used for artifact manufacture.

TABLE 14

| Species | Larcom-Haggard | Elliott | Country Club |
|---|---|---|---|
| *Amblema costata* (Raf) | 9 | 16 | -------- |
| *Quadrula quadrula* (Raf) | 4 | 9 | -------- |
| *Quadrula pustulosa* (Lea) | 1 | 1 | 2 |
| **Quadrula pustulosa prasina* (Conrad) | -------- | 2 | *2 |
| **Tritigonia verrucosa* (Raf) | *4 | *4 | -------- |
| *Uniomerus tetralasmus* (Say) | 1 | 2 | 1 |
| *Pleurobema coccineum* (Conrad) | -------- | 2 | -------- |
| **Lampsilis anodontoides* (Lea) | 1 | *17 | 1 |
| *Lampsilis fallaciosa* (Smith) | -------- | 1 | -------- |
| *Lampsilis ventricosa occidens* (Lea) | -------- | 1 | -------- |
| *Lasmigona complanata* (Barnes) | 2 | 4 | -------- |
| *Proptera alata megaptera* (Raf) | -------- | 7 | -------- |
| *Proptera capax* (Green) | 1 | -------- | -------- |
| *Obliquaria reflexa* (Raf) | 1 | 3 | -------- |
| *Leptodea fragilis* (Raf) | -------- | 4 | -------- |
| *Truncilla truncata* (Raf) | -------- | 2 | -------- |
| Number of specimens | 24 | 75 | 6 |
| Number of species | 9 | 15 | 4 |

*Indicates species represented by worked and unworked specimens.

*Pendant of whole shell.*—This specimen is made from the smoothed shell of *Quadrula pustulosa prasina* (Conrad), which has been perforated for suspension by a deep horizontal cut sawed through the back near the umbo. It is from pit B, mound 1, Country Club site.

*Notched shell.*—The chalky and incomplete right valve of a *Tritigonia verrucosa* (Raf) has 11 small unevenly spaced notches along the ventral margin. At the center of this notched edge a 20-mm. segment has been broken off; probably it carried 6 or more additional notches. The umbo is partly broken away, and there is no sign of a former perforation or any other modification. The purpose of this notching, if not decorative, is unknown. The specimen is from pit 6 at the Larcom-Haggard site.

*Scraping tools* (?).—Four shells from pits 5 and 8, Elliott site, have had the posterior end sharpened by grinding down the ventral margins of the shells. Otherwise unmodified, they may have been used as scrapers, e. g., in smoothing pots or other surfaces, or as spoons. One specimen is made from the left valve of a *Tritigonia verrucosa* (Raf); the others are *Lampsilis anodontoides* (Lea).

### RÉSUMÉ; SUMMARY OF ARTIFACTS FOUND

That the Indians who once dwelt on the three Cowley County sites described above shared the same material culture inventory is obvious, assuming that our comparatively limited artifact sample is representative. An item-by-item comparison, as summarized in table 15, merely emphasizes what was already apparent in the field, namely, that almost without exception the specimens from any one site could not be distinguished from those found at either of the others. Items which, as shown in the tabular summary, were found at two sites could with reasonable confidence be expected to occur at the third also, if more extended work were undertaken; at least, I doubt strongly that bowls, strap handles on pots, incised sherds, cancellous bone artifacts, pipes, etc., were unknown and unused by the occupants of the site for which we have respectively no entry. And, with exception of the mealing slab and hematite, those items which are indicated but once seem generally to be so rare or unusual in the region that they may be regarded either as products of individual whim or fancy, as in the case of ring beads, tubes, and tibia shaft straighteners, or else as trade pieces, as for example, the punctate and engraved sherds, the celts and the cupstone. Pending new evidence to the contrary from future excavations, then, we may tentatively conclude that these three sites constitute a cultural unit. For this unit of three sites, to which others may be added as relationship is shown, I suggest the name Lower Walnut Focus.

Among the native culture complexes now known in Kansas, the three sites here designated the Lower Walnut Focus appear to have their closest relationships with the sites in Rice and McPherson Counties which I have termed the Little River Focus. There are notable differences, however, and at the moment these seem sufficient to warrant a distinction between the two site groups, which are situated approximately 100 miles apart.

We have already noted that the Lower Walnut pottery is almost exclusively shell tempered, whereas the Little River wares are preponderantly sand tempered; that flat vessel bases and handles are proportionately much less plentiful in the Little River sites than in Lower Walnut River; that bowl forms are indicated for Lower Walnut but not for Little River; and that simple stamping, represented on 12 to 35 percent of Little River sherds, is wholly absent from our Walnut River collections. With respect to bonework, the

TABLE 15.—*Summary of artifacts from three sites in Cowley County, Kans.*

| Artifacts | Larcom-Haggard, 14CO1 | Elliott, 14CO2 | Country Club, 14CO3 |
|---|---|---|---|
| Pottery: | | | |
| Type Cowley Plain sherds: | 850 | 200 | 250 |
| Jars, restored | ----- | 1 | 3 |
| Bowls, restored | 1 | ----- | 2 |
| Base flat, circular | 22 | 6 | 3 |
| Lip rounded, plain | 35 | 10 | 5 |
| Lip rounded, diagonal incised | 14 | 3 | 4 |
| Rim incised inner upper | 1 | ----- | ----- |
| Handles, loop (including fragments) | 14 | 2 | 10 |
| Handles, loop, riveted | 10 | 2 | 4 |
| Handles, loop, decor | 1 | ----- | ----- |
| Handles, loop, angle nodes | 2 | 1 | 5 |
| Handles, strap (including fragments) | 12 | ----- | 1 |
| Handles, strap, riveted | 7 | ----- | ----- |
| Handles, strap, angle nodes | 3 | ----- | 1 |
| Incised sherds, body | 4 | ----- | 1 |
| Sand-tempered sherds | 2 | 4 | 9 |
| Redware sherds | ----- | ----- | 2 |
| Punctate sherds | 3 | ----- | ----- |
| Engraved sherd (see text) | 1 | ----- | ----- |
| Rio Grande glaze sherds | 4 | ----- | 1 |
| Bone artifacts: | | | |
| Scapula digging tools | P | P | P |
| Awls: split mammal leg bone | 2 | 3 | ----- |
| Awls: neural spine or rib edge | 10 | 4 | 2 |
| Shaft straighteners, deer tibia | ----- | 2 | ----- |
| Scored implements, rib | 3 | 5 | 4 |
| Cancellous bone artifacts | 1 | 1 | ----- |
| Tubular beads | 5 | 6 | 5 |
| Ring beads | 2 | ----- | ----- |
| Tubes | ----- | 1 | ----- |
| Miscellaneous worked pieces | 4 | 2 | 2 |
| Chipped stone: | | | |
| Projectile points: | | | |
| (a) Small, triang., unnotched | 58 | 44 | 7 |
| (b) Small, triang., notched | 5 | 10 | 1 |
| (c) Small, triang. or leaf-shaped | 9 | 8 | ----- |
| (d) Other | ----- | ----- | 1 |
| Drills (including fragments): | | | |
| (a) Plain-shafted, large, heavy | 3 | 1 | 2 |
| (b) Expanded base, grad. widened | ----- | 2 | 1 |
| (c) Expanded base, abruptly widened | 15 | 5 | 1 |
| Knives, with unbeveled edges | 7 | 25 | 2 |
| Knives, beveled; notched or stemmed | 7 | 3 | 1 |
| Knives, beveled; not notched or stemmed | 2 | 4 | ----- |
| Beveled fragments, unclassified | 22 | 10 | 3 |
| End scrapers | 99 | 42 | 25 |
| Side scrapers | Ca. 30 | Ca. 15 | Ca. 25 |
| Chopping tools | 4 | 5 | 3 |
| Ground and pecked stone: | | | |
| Mealing slab fragment (?) | ----- | ----- | 1 |
| Manos | 3 | 4 | 2 |
| Grooved mauls | 1 | 1 | 1 |
| Shaft smoothers (including fragments) | 13 | 15 | 3 |
| Sharpening blocks | 4 | 4 | 2 |
| Shaft polisher (?) | ----- | 1 | ----- |
| Rectanguloid block | ----- | ----- | 1 |
| Pipes, incomplete | ----- | 2 | 2 |
| Celts | ----- | 2 | ----- |
| Cupstone | ----- | ----- | 1 |
| Hematite pigment | ----- | ----- | 4 |
| Shell objects: | | | |
| Whole shell pendant | ----- | ----- | 1 |
| Notched shell | 1 | ----- | ----- |
| Shell scrapers | ----- | 4 | ----- |

Lower Walnut Focus has socketed scapula digging tools while those from Little River sites are usually unsocketed; Little River has split-rib awls but Lower Walnut does not; and solid bone projectile points are exclusively Little River. In regard to chipped stone, our collections suggest that in Lower Walnut sites, expanded base drills predominate over straight forms, whereas the reverse is true in Little River; and also that, while small triangular projectile points characterize both foci, unnotched forms are proportionately much more abundant in Lower Walnut than in Little River sites. With respect to the sites themselves, a striking difference is the occurrence of the "council-circle" complex at Little River sites and its apparent absence from all known Lower Walnut River sites.

Along with the above differences, there are many close resemblances in the inventories from the two localities, as is obvious from an inspection of the respective summary tables (cf. tables 12 and 15). The ceramic remains, despite the differences manifested in tempering materials and in other details, seem to me to be variants of a single tradition; and in the matter of bone and stone industries, the resemblances impress me as perhaps more basic than are the dissimilarities. Our Lower Walnut sites compare rather more closely with the Thompson and Malone sites where, as in Cowley County, our excavations were of short duration and limited extent. The Tobias site, where we opened two unidentified subsurface structures as well as cache pits and refuse mounds, shows a longer inventory and greater variety of implement types. It is entirely possible that some of the focus differences we now see, as above enumerated, would become less marked, or even that they would vanish, if excavations on the scale we carried on at Tobias were conducted at the other sites involved.

At the moment, I believe the focus distinctions made here promise to be useful and valid; and the many close similarities, which I suspect extend to the basic settlement patterns and the subsistence economies as well, further justify the combining of these two foci into a larger grouping for which I have elsewhere (Wedel, 1947, p. 151) proposed the term Great Bend Aspect. To this larger grouping, either within one of the two proposed foci or in other foci yet to be defined, can probably be assigned all archeological materials in central Kansas which have previously been included under the term Paint Creek culture (Wedel, 1940, pp. 332 and 343, fig. 21).

The wider relationships of the Great Bend Aspect, and its chronological and cultural implications for Central Plains prehistory, will be considered in a later section.

## ARCHEOLOGICAL INVESTIGATIONS IN WESTERN KANSAS

### SITES ON SALT CREEK IN LANE AND SCOTT COUNTIES

Salt Creek is a short inconsiderable stream that rises on the High Plains of northeastern Scott County and flows in a northeasterly direction across the northwest corner of Lane County to join the Smoky Hill River in south-central Gove County (fig. 75). The valley, perhaps 15 miles from source to mouth, is shallow and has gently sloping sides in its upper portion, with occasional low rocky

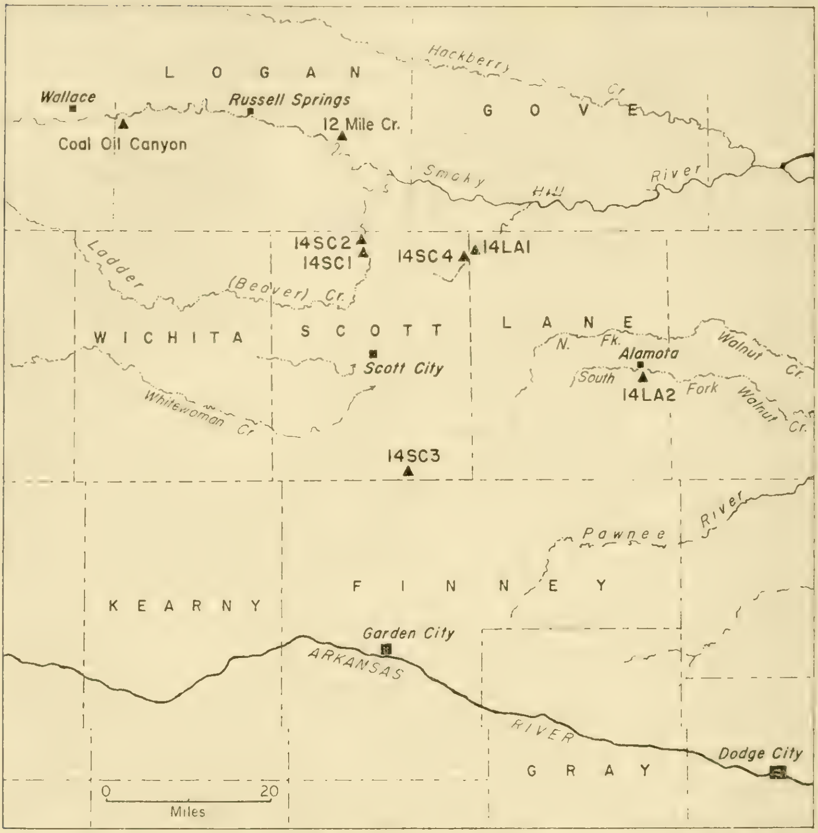
LOGAN
Hackberry Cr
Wallace
Russell Springs
Coal Oil Canyon
12 Mile Cr.
GOVE
Smoky Hill River
14SC2
14SC1
14SC4
14LA1
Ladder (Beaver) Cr.
WICHITA
SCOTT
Scott City
LANE
N. Fk.
Walnut Cr.
Alamota
South Fork Walnut Cr.
14LA2
Whitewoman Cr.
14SC3
Pawnee River
FINNEY
KEARNY
Garden City
ARKANSAS RIVER
GRAY
Dodge City
0
20
Miles

FIGURE 75.—Map showing location of certain archeological sites (solid triangles) in western Kansas. Coded sites include: 14LA1, Pottorff; 14LA2, Walter; 14SC1, Scott County pueblo site; 14SC2, Young burial site; 14SC3, Pony (Pawnee?) Mound; 14SC4, Risston.

outcrops on the east. A mile or two above the Lane County line, the stream enters the rolling hilly terrain bordering the main valley of the Smoky Hill. Here as the valley deepens, permanent springs make their appearance, and the channel develops a meandering habit. Rocky bluffs become more numerous; they are most abrupt and continuous on the right side, though seldom as much as 40 or 50 feet high.

As the stream leaves Scott County, the bluffs on the left bank close in so that the valley is a scant 200 to 300 yards in width. There are numerous small but pleasant terraces beginning about where permanent water first appears, and these continue for several miles downstream. The flow is not impressive in volume, and we were told that during the heavy dust storms of the mid-1930's the channel was completely choked at several points. In 1939, however, the flow was regular, and there were frequent long narrow ponds containing fish, large bullfrogs, and other aquatic forms. The banks were generally muddy, though clean sand was easily found not far below the surface silt.

The valley of Salt Creek, like that of most typical Plains streams, is sparsely timbered. Hackberry, cottonwood, and willow are the principal larger forms, occurring as clumps wherever the creek curves against the bluffs, and providing a welcome relief from the short grass-yucca-cactus assemblage of the surrounding uplands. Lesser growths included chokecherry, wild plums, wild grapes, fragrant sumac and, in disquieting abundance, extensive thickets of poison ivy. Saltgrass, from which the creek is said to have gotten its name, is present in some of the protected draws. Watercress introduced by the settlers now flourishes about some of the larger springs. Muskrat, raccoon, coyote, badger, skunk, and other small fur bearers still exist; an otter is said to have been killed on the creek in the early days, but there is no recollection of beaver. Of the surprisingly varied and abundant avifauna, including various raptores and passerine species, perhaps the most interesting to our party was a Carolina wren who persistently endeavored to construct a nest in the turned-up flap of the cook tent door.

The archeological possibilities of this little valley were first brought to my notice by A. T. Hill, of Lincoln, Nebr.; and the desirability of systematic excavations became apparent when visitors to our camp in Scott County State Park showed us small sample collections of curiously varied materials found intermingled on certain of the terraces. As elsewhere in the western Plains, so here the devastating dust storms of the 1930's had stripped away much of the loosened topsoil wherever the valley floor and slopes were under cultivation. The relative abundance of artifacts on the denuded surfaces had attracted collectors from a considerable distance in every direction, though with rare exceptions there seems to have been comparatively little actual digging. Most of this nonprofessional activity on Salt Creek had taken place within a mile or so of the Lane-Scott County line, above as well as below. Here, too, most of our work was done, though surface examination indicates that small amounts of material are to be found almost anywhere in the valley that is conveniently accessible to live water.

### THE POTTORFF SITE (14LA1)

The principal site on Salt Creek, so far as is known, is in Lane County, about three-quarters of a mile east of the Scott County line. It is situated on land which, at the time of our work, was owned by C. D. Pottorff. Here the stream makes a series of serpentine bends, within each of which is a flat well-defined flood-free terrace of 2 to 5 acres extent backed by a low bluff or steep hill. The first three terraces formed by the creek after it enters the former Pottorff property are of particular interest to us here, though there are also indications of habitation on at least two others immediately to the north, downstream. Just above the upper edge of the middle terrace, an excellent spring issues from the foot of the east bluff, and there is another smaller one a few rods to the south. Perhaps 300 yards to the northwest, across the creek, a short grassy swale cuts the west bluff line, giving rise to several small springs and seeps. It may be presumed that in Indian days all of these were permanent and insured at least a modest flow of water in the creek here at all times. At no point would persons residing on any of the upper three terraces have been over 150 yards from a suitable spring; and if water from the creek were usable this distance could have been halved. Undoubtedly, the proximity of a dependable supply of good water, with its beneficial effects on tree and grass growth and the consequent attraction of large and small game, was an important factor in the selection of the site by native peoples. At any rate, it is clear that the remains, though not indicative of long occupation by large numbers of Indians, represent repeated utilization of the spot by distinct groups over a time span of several centuries.

As might be expected from the situation of the springs, the heaviest concentration of Indian remains occurs on the middle terrace and the nearby north part of the first (south) terrace. When we first saw the site, surface traces were not abundant, but the handful of sherds, projectile points and fragments, and other scraps picked up bore out our earlier information as to the diversity of types present. More intriguing still was the discovery on the gently sloping north (downstream) margin of the middle terrace of a very dark, refuse-bearing soil stratum not visible on the flat above the slope. Preliminary tests and borings showed that this stratum, heavily mixed with broken animal bone and up to 12 or 15 inches thick, underlay much of the terrace at a depth of approximately 24 inches. It was overlain by an approximately equal thickness of brown sandy soil, devoid of cultural admixture except where refuse had been redistributed in rodent burrows and man-made features. The uppermost 6 to 10 inches consisted of dark-gray humus, with which more bones, charcoal, chipped flints, flakes, sherds, etc., were intermingled. Unhappily, an unknown but reportedly considerable amount of surface soil has been blown from all of these terraces in recent years, so that the later and seemingly more transitory protohistoric and historic stages in the local sequence have been disturbed and in large part obliterated.

The middle terrace had a breadth of approximately 250 yards in each direction. Its south, west, and north sides were skirted by the creek, with the ground rising steeply on the east to the uplands bordering the valley (pl. 57, *a*). On the south the stream flows directly against the foot of the terrace and there is a steep bank 18 or 20 feet high, but on the west and north progressively widening gentler slopes intervene between the flat and the channel. A south-to-north profile through the terrace thus would show an abrupt rise of about 18 feet from the creek bed, then a nearly flat surface some 125 to 150 yards wide, and finally a gentle glacislike slope of about 100 yards to the creek bank at the north. Our tests showed a somewhat heavier accumulation of refuse on the surface of the terrace just above the northward slope, and on the eroding upper slope itself was the outcrop of dark bone-bearing soil. Along this "break" from the flat to the slope, and slightly east of the north-south midline through the terrace most of our excavating was done.

To insure uniformity in recording horizontal relationships of finds, the terrace was staked out on a grid of 30-foot squares. Lines running north and south were lettered A, B, C, . . ., beginning on the west; those running east and west were numbered 1, 2, 3 . . ., beginning on the north. Each 30-foot square in turn, when excavation therein began, was further divided into 25 units, each 6 feet square. These units were numbered from 1 to 25, beginning in the northwest corner of the square and at the west end of each successive row of units. Thus, the complete designation for any 6-foot square unit was a trinomial, e. g., square R 26:1, and this designation would appear on all specimen bags containing material from that unit. Bulk of the material was segregated vertically by 6-inch levels. Outstanding specimens or features were more precisely recorded by triangulation from two corners of a specified square or unit plus exact indication of depth below ground surface. All our larger tests and excavations on the middle and south terraces were tied into this one system of coordinates, and these in turn with the terrace contours, creek, and springs.[36] I have found it convenient in the ensuing discussion to treat the excavations by areas.

It should be stated at the outset that the stratification detected in our preliminary tests was amply confirmed in the subsequent excavation, and that it has important connotations which will be discussed at more length elsewhere. At the risk of pointing out the obvious, it should be noted that the various strata briefly characterized above were not everywhere of uniform thickness or richness of content. The top layer particularly was often thin, sometimes being virtually absent when the plowed soil was removed. Likewise, the sterile intervening layer thinned considerably from the south edge of the terrace northward, while the buried dark stratum yielded better at the north than at the south. Such variations, of course, are to be expected where the vagaries of fluctuating climatic conditions operate between successive human occupations. Far from detracting from the validity of the observed sequence, they merely emphasize the truism that at any given point it is the relative position and context of an artifact or feature, rather than its absolute depth from an arbitrary plane, that is significant.

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[36] In July 1939, the Scott County engineer was engaged for 3 days to survey the Pottorff site and also "El Cuartelejo" in nearby Scott County State Park. The contour and other maps which were to have been prepared have not been delivered at this writing, and our own sketch maps only are available.

### AREA A (HOUSES 1 AND 2)

On the basis of soil showings in our preliminary tests, we selected for more careful investigation a spot at the upper edge of the bone-bearing outcrop and on the nearby flat just above. Here, instead of the customary 5 or 6 inches of mixed topsoil underlain by several inches to a foot of sterile fill, there occurred a heavy deposit of ash lenses, animal bones, stones, sherds, and flints, in such profusion that a refuse deposit of some size was suspected. Careful dissection of the deposit disclosed the fact that it had accumulated in two small pit-houses lying close together and, in one case, partly intruding the lower buried soil stratum. The "area" lies in squares R26 and S26, and includes about 828 square feet (fig. 76).

House 1, the uppermost and later of the two (pl. 58, *a*), was subcircular in plan, with an average diameter of about 12 feet 6 inches. At the center, 17 inches underground, was a circular firepit 19 inches

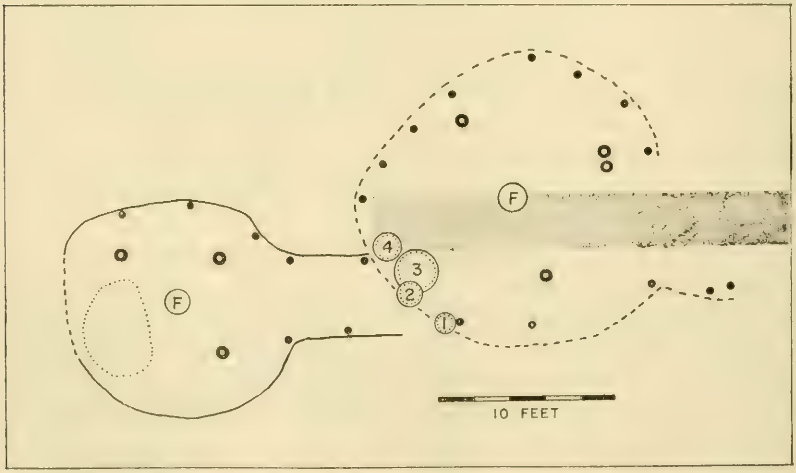

FIGURE 76.—*Left,* Plan of house 1; *right,* plan of house 2; Pottorff site 14LA1. *F,* fireplaces; numbered circles, prehouse pits; shaded strip, exploratory trench; stippled outline, basin in house 1. Both entrances toward east.

across, containing a 3-inch bed of white wood ashes underlain by 1 to 2 inches of hard fire-reddened soil. From the fireplace, the rather indistinct floor rose slightly in all directions, to turn upward sharply at the vertical pit wall. Throughout most of the circumference of the pit this upturn was easily traceable, because of discoloration and hardening by fire. We were unable to locate all of the postmolds, but enough were found to indicate their general arrangement and size. Three of the original four central postmolds were found, all at a distance of just under 4 feet from the hearth center and forming two sides of a square 6½ feet across. These molds were 8 to 10 inches in diameter; their depth seems to have been about 12 to 15 inches, but is uncertain because the holes penetrate the underlying cultural stratum. Three smaller postmolds 4 to 6 inches across and 4 feet apart were found at the base of the north wall; one had a broken bison bone stuck in with the joint end up as if to wedge a wobbly post. Four other postmolds of comparable size defined the entrance, which was 51 inches wide, about 6 inches higher than the house floor, and extended 4 feet or more due east from the house. There can be no doubt concerning the position of the postmolds shown on our plan (fig. 76), since at and just below floor level all were filled with dark mixed soil and burned earth that contrasted sharply with the unmixed surrounding matrix.

West of the fireplace was an elliptical basin 66 by 45 inches, whose floor lay a few inches deeper than the house. It seems to have preceded the house, contained nothing worthy of note, and served only to conceal the location of the fourth central post. South of this, another smaller basin or pit had been dug into the house wall. This was 14 inches north to south, 30 inches east to west, and lay 19 inches below ground surface. It does not seem to have reached the surface, however, since the uppermost 11 inches of soil over the mixed pit fill was clean and apparently undisturbed. Presumably the pit had been dug from within the house, and served as a cache or storage place for household articles. It contained no artifacts, but there were a few charred sticks and bits of burned earth suggestive of the material found on the house floor.

Scattered over the floor east and north of the fireplace were segments of charred sticks and poles up to 2 inches in diameter, as well as quantities of burned grass, osiers, and similar finer materials. These may well have come from the walls and roof when the house collapsed or was destroyed. There was comparatively little wattling clay, and it cannot be stated with certainty that the structure was earth covered. The heavy admixture of ash, charcoal, bones, and other refuse in the soil from 2 or 3 inches above the floor to the ground surface undoubtedly means that the depression left by the fallen lodge was used as a trash dump by other peoples residing on the terrace nearby. It is possible that before the depression was entirely filled in there was a temporary structure on the same spot, for 10 inches above and partially overlapping the original fireplace was a second hearth 21 inches across containing 3 inches of ash underlain by 2 inches of burned earth. There was no suggestion of a floor about this later fireplace, though it must have been used for some time. Finally, it was specifically noted that sherds and other artifacts from ground surface to house floor were of the same general types, and offer not the slightest reason to believe that a culturally deviant group had taken over the site.

House 2 lay immediately east and slightly north of house 1, where the ground surface slopes gently toward the north (pl. 58, *b*). Because of this slope, its floor was some 10 inches lower than that of house 1, with a depth below the surface of about 18 inches at the south edge and of about 8 inches at the north. Determination of house form, floor level, and other features was much more difficult than in house 1, partly because the structure had been rather irregularly laid out, but primarily because over much of its area the pit had penetrated the top of the discolored buried culture stratum. The firepit, fortunately, was very well marked, and by working carefully outward in all directions from that point it was possible finally to delineate the house pit in more or less satisfactory fashion.

This house also was subcircular in outline, varying in diameter from 16 to 17 feet (fig. 76). Approximately in the center was an ash-filled basin 24 inches across, with the underlying soil baked a brick-red color to a thickness of 2 inches or more. Eleven postholes of the outer series, each about 4 inches in diameter, were found near the edge of the floor; out of one of them protruded a broken bison leg bone suggesting improvisation as a wedge. Slightly larger postmolds, believed to indicate the central supports, were found 5 to 6 feet from the hearth, to the northwest and southeast. At the same distance to the northeast were two postholes a few inches apart that probably represent the third central support; the fourth, southwest of the hearth, was inadvertently dug out in cutting a test trench through the house before it was recognized as such. All of the central supports are much nearer the outer series than is customary in Plains pit houses, though comparable arrangements have been found in Nebraska.

Southeast of the hearth three small postholes were found beyond the outer series, and these apparently constituted part of one side of the entrance passage whose floor was about 5 inches above the house floor level. The corresponding posts on the other side of the passage were evidently cut away by the same trench that had destroyed the southwest center post.

There were no basins, cache pits, or other features in the floor of house 2, nor was there any wattling clay or other convincing evidence as to the nature of the structure that once stood here. Like house 1, however, house 2 was certainly in part excavated, conforming in this respect and in posthole arrangement to semisubterranean earth-lodge sites of the Republican valley in Nebraska. The fill varied from place to place, but like that in house 1 included lenses and pockets of ash, bone, charcoal, and worked materials, indicating utilization of the depression as a refuse dump. A few inches above the floor, over the north part of the house, was a later fireplace about 20 inches in diameter, with the underlying earth stained red to a depth of 3 or 4 inches. There is, thus, ample evidence that people were carrying on their domestic activities on the terrace and depositing refuse on the sites of both houses for some time after the latter had collapsed.

It has already been suggested that house 1 was the more recent of the two. The evidence is inconclusive, however, though there is some slight reason to believe that the entrance passage for house 1 extended over the southwest edge of house 2 (pl. 58, *c*). Had the identity of the two structures as houses, instead of as simple middens, been recognized sooner, it is possible that their exact time relationship could have been firmly established. This does not seem to be a crucial deficiency in our data, however, for the houses appear to be of the same basic type and the artifacts from and overlying each were identical. In short, there is no reason to suppose that unrelated cultural groups built and used the two structures, or that the refuse which filled the abandoned house pits was left by another people unrelated to the original occupants. The remains taken from these two houses conform closely to sherds and chipped artifacts from the upper 6 inches of occupational deposit on the terrace generally—remains which are hereafter collectively referred to as Occupation A.

House 2, as already indicated, reached and in places penetrated slightly the older buried culture stratum that outcrops on the north slope of the terrace. There is evidence, however, that smaller pits or basins attributable to Occupation A, had been dug before the excavation was made for the house. This consists of 4 shallow circular depressions which lay close together just under the southwest edge of the house, and of which no trace could be detected in or above the floor. Their relative position is indicated in figure 76; they ranged in diameter from 11 to 30 inches and in total depth below ground surface from 26 to 30 inches. These, like the central and eastern portions of the house floor, were sunk from 1 to 3 inches into the top of the underlying culture stratum, from which their fill was easily distinguished. All contained ash, charcoal, and bones; the only artifacts were a projectile point and an incised bone bead. The purpose for which these pits were dug is not clear, since so little of their original form remained. The single projectile point and the bone bead suggest affiliation with the other Occupation A materials, and construction at a time not long before the overlying house 2 was built.

The limited time at our disposal did not permit careful exploration of the older stratum under and about house 2, which for convenience we designate Occupation B. In general, it was very much darker in color than the Occupation A layer and the house fill, of rather coarse texture, with fine white veins of calcareous material that frequently occurred as a thin patina on sherds, bones, flint chips, and other objects from the formation. The layer was approximately 13 to 15 inches thick at this point, with the upper limit rather more sharply defined than the lower. No firepits or other structures clearly attributable to Occupation B were detected in this area, and cultural debris was not very plentiful. There were, however, a number of calcite-tempered heavily cord-impressed sherds quite unlike the pottery from Occupation A; and on the final day of our dig, while the floor of house 2 was being deeply spaded in a last-minute search for possible subfloor structures, a large rocker-marked sherd (USNM 387276) was turned up 9 inches beneath the floor northeast of the firepit and unquestionably attributable to Occupation B. There can be no doubt, therefore, of the existence under houses 1 and 2 in area A of a second, older, and culturally dissimilar stratum, whose characteristics can be more fully set forth when our other excavations have been described.

### AREA B

Some 10 to 25 yards east of house 2, we excavated an area of approximately 720 square feet to a depth of 24 to 30 inches—deep enough, that is, to work out the two culture-bearing strata revealed in our tests. This area lay mostly in square U26 and the west edge of V26, with a 6-foot trench running 24 feet north along the edge of V25. Also included is a stratitest nearly 6 feet deep in units T27:4 and T27:5, just south of the main excavations. A trench 2 feet wide connected the main excavations with those in area A; it ran to the west edge of house 2 before the house was recognized as such, and obliterated the north line of postholes of the house entrance, the southwest center posthole, and the south edge of the fireplace.

The trench connecting areas A and B crossed a shallow swale where the ground surface lay approximately 1 foot lower than at the west edge of house 2 and in area B. Both the occupations recognized in area A occurred in this trench; they dipped slightly toward the center of the cut and rose again toward area B. It is evident, thus, that this depression in the terrace edge has existed for a considerable time. In profile, the trench showed a gray fine-textured top layer

5 to 7 inches thick, containing flecks of charcoal, scattered animal bones, flint chips, and a few artifacts. Throughout most of the trench this material lay in direct contact with the lower culture stratum; light-colored unmixed soil appeared between the two only at the rising east end. The lower stratum (Occupation B) contained more organic matter, was much darker in color, and had a somewhat coarser texture. Bones occurred in some quantity, but artifacts were not plentiful. The upper limit of this horizon was rather irregular, possibly representing a local erosion surface where runoff had prevented formation of a noncultural deposit between successive occupations or where such material as may once have been deposited was again removed before Occupation A was established. Another complicating factor that tended to blur the hoped-for clear-cut stratigraphic separation was the extraordinary activity of burrowing animals. It is to these that we ascribe the occasional presence of an Occupation A artifact in the lower stratum; the finding of one Occupation B sherd in the upper stratum can be attributed either to the same agency or to the expectable occasional mixing of materials of different age where a later people lived directly on the still partially exposed site of an earlier camp. No fireplaces, structures, or midden concentrations were noted along the course of the connecting trench.

Over most of Area B, the upper culture stratum was separated from the lower by 6 to 10 inches of light buff-colored sandy soil virtually devoid of cultural admixture, but in the northern portions where the ground surface sloped toward the creek the two occupations were again in contact. In thickness, the upper stratum varied from 4 to nearly 12 inches, being everywhere gray in color with an abundance of charcoal, bone, flint chips, and occasional sherds, small well-made projectile points, and scrapers. The only aboriginal construction noted was a deep basin or pit which lay 60 feet due east of house 2, in square U26:5. This was first detected at a depth of 3 or 4 inches, i. e., just below plowed soil, as an incomplete thin ring of dark-brown burnt earth. Excavation revealed a pit 36 inches across the top, 26 inches across the bottom, and 22 inches deep from the present ground surface. The walls had been hardened, apparently by burning, but to a thickness of only a quarter- or half-inch. Ashes covered the floor thinly and were scattered through the fill above, which yielded in addition a few small thin cord-roughened sherds, a triangular point, flint chips, burned stones, and fire-blackened bones. It is not clear whether this was a storage pit with walls made moisture-resistant by burning or had been used in cooking or for some other purpose. It had been dug from the Occupation A layer through the light-colored sandy nonoccupational stratum, here 13 inches thick, and the bottom penetrated 3 or 4 inches into the dark bone-bearing Occupation B layer.

Most of the artifacts from which Occupation B has been identified came from this area; they were not plentiful but their stratigraphic relationship to Occupation A is generally clear cut. The containing stratum was very dark gray, in places almost black when freshly exposed, and everywhere included broken animal bones, lumps of charcoal, broken mussel shells, roughly flaked flints and spalls, etc. A number of heavily cord-impressed sherds, including thick straight rims, several complete and fragmentary stemmed points, a bone bead, and a notched shell were the principal artifacts. Two or three of the sherds were taken out of the lower part of the Occupation A stratum, either where the two horizons were in direct contact and separable only with difficulty or where rodent burrows could be traced from one level to the other.

Of structures or other features clearly assignable to Occupation B there is but one example—a small basin about 10 feet south of the burned pit described in a preceding paragraph. This basin, 16 inches below present ground surface, was unquestionably dug from the buried stratum, being directly overlain by the unbroken noncultural layer between Occupations A and B. It was circular in plan, flat bottomed, and measured 20 inches across the top, 18 inches across the bottom, and 6 inches deep. The fill included much charcoal and burned earth, but relatively little ash, and no artifacts. There was nothing to indicate that this fireplace, if such it was, had been part of a house unit or other construction.

A few yards south of the above excavations, in units T27:4 and T27:5 we made a deep test during the closing days of our dig. The primary purpose was to determine the nature of the terrace soils underlying Occupation B, with the acquisition of artifacts an incidental consideration. Somewhat to our surprise, this work disclosed evidence of what may represent a third and yet older level of human activity—a level whose cultural affiliations must remain conjectural for lack of definitive artifact associations. The sequence of strata revealed in this test (pl. 59, *b*) is given below, with depth data reading from the ground surface downward; measurements are approximations, since lines of differentiation were usually not clear cut and the thickness of strata often varied by several inches. The accompanying descriptive notes are based entirely on direct visual examination of the column in the field; no chemical analyses or microscopic studies were attempted. Soil samples were taken from each stratum indicated, and these are part of our collection from the site (USNM 387500–387507).

Test boring with a 4-inch auger from the bottom of the excavation showed that the yellow-buff formation underlying Occupation C continued unbroken to 97 inches. Here the bit encountered a 2-inch

TABLE 16.—*Soil stratification in Square T27:4, Pottorff site*

| Depth From surface (inches) | Description | Designation |
|---|---|---|
| 0–3 | Soil fine, light gray; plow-turned, with flint chips, bones, etc. (soil sample 387500). | Occupation A. |
| 3–8 | Soil fine, light gray, not plow-turned; flint chips, bones, charcoal, thin cord-roughened sherds, unnotched projectile point (soil sample 387501). | |
| 8–15 | Soil very fine buff to light gray, hard and compact, without visible bedding lines; one chip, several bone fragments (soil sample 387502). | Nonoccupation. |
| 15–36 | Soil dark gray, granular, with network of fine white calcareous lines; traversed by numerous rodent burrows and large root (?) paths; contains charcoal lumps, broken and burned animal bone, mussel shell fragments, flint chips, thick cord-roughened sherds, concentrated at or near 21-inch level (soil sample 387503). | Occupation B. |
| 36–48 | Soil yellowish brown to buff, drying to very light gray; fine calcareous veining; much rodent activity; 3 tiny bone fragments noted (soil sample 387504). | Nonoccupation. |
| 48–64 | Soil dark gray, fine textured, with calcareous veining, more compact than layer immediately above; bone fragments, flint chips, charcoal, shell fragments, fire-blackened and heat-fractured stones (soil sample 387506). | Occupation C. |
| 64–70 | Soil yellow buff when freshly dug, dries nearly white; fine textured, with calcareous veining (soil sample 387507). | Nonoccupation. |

seam of dark-brown soil, possibly burnt, with bits of charcoal intermingled. From 99 to 123 inches there was a gray sandy soil containing sufficient clay to "wad" easily in the hand, and this was underlain by 10 inches of gray mottled clay with iron oxide stains. The test bore ended at 137 inches depth in a brownish-gray clay soil. On the basis of our observations, it seems improbable that any of the strata traversed by the auger can be considered as evidencing human habitation.

### AREA C

The excavations considered here lay on the northward slope of the terrace about 80 yards north and west of area A and 30 yards from the bank of Salt Creek. The principal test was a trench 18 feet long by 5 feet wide, with a depth of 5 to 6 feet, along the west edge of square O 19; other excavations to maximum depth of about 30 inches were made east from this trench and in square P 18. The total area covered in this work approximated 500 square feet. Generally speaking, the soil here was much sandier at all levels than that on the flat to the south; and the nature of occurrence of cultural materials suggests that the surface at time of Indian occupation was not so regular and even as is the present slope.

As revealed in the east wall of the trench in square O 19 the topmost 4 inches consisted of a light-gray, plow-loosened soil in which relatively little cultural admixture could be detected. Below this disturbed zone, to a depth of 8 to 10 inches, the soil showed some color variability, but contained abundant animal bones, some flint chips, potsherds, and chipped artifacts. Particularly striking was the bone refuse, much of it broken and/or fire blackened, which was spread 2 or 3 inches deep on what must have been a gently undulating surface. Near the middle of the trench this layer divided, with a somewhat thinner stratum descending and then, about 3 inches below, paralleling the upper one; between the two was light-colored sandy soil. At the north side of unit O 19: 21, the combined bone layer dipped to 13 inches to lie just above, or on, a buried basin 46 inches in diameter by 10 inches deep, which was filled with very dark carbonaceous earth. Burrowing animals had traversed this basin, distributing black soil therefrom in all directions. From the basin, a dark sandy soil sloped downward from 12 inches at the south end of the trench to 28 inches at the north end. This, presumably, represents an old ground surface into which the basin, possibly a firepit, had been dug, and which was subsequently buried by the light-colored sandy soil and the bone refuse layers (pl. 59, *a*).

The dark sandy soil zone had a strongly defined upper limit; downward, it graded into lighter material, in which were occasional broken bones, charcoal, pockets of very dark burned soil, and irregular lenses of fine to coarse sand gravel. These sand lenses contained some snailshells, and suggest deposition in running water. Other than flint chips and charcoal, there was little material suggesting human activity below the dark, sandy soil at about 24 to 30 inches depth. Exceptions were a cut bird bone in O 19:16 at 36 inches, and a lump of hematite in O 19:11 at 47 inches. At the north end of our trench, where the floor was 6 feet deep, we dug a smaller test to 10 feet 4 inches, encountering only clean fine sand.

East and northeast of the trench, the strata revealed in our excavations appeared to be mainly a continuation of the upper formations in the trench. Bone refuse continued plentiful in a layer varying between 12 and 18 inches below the surface, and this correlated apparently with the upper bone layer in the east trench wall. The soil beneath the bones, at depths up to 19 or 21 inches, showed occasional ashy and darkened spots suggestive of burning, and I suspect this level would equate with the "dark sandy soil" surface containing the buried hearth in square O 19:21. Two other hearths or hearthlike structures were found about 20 yards northeast of the latter, in unit P 18:15. At this point 12 inches of mixed soil overlay the bone layer, which in turn was separated by about 7 inches of sterile fill from a fire-blackened surface 21 inches underground. Immediately above the bone layer was a 30 by 40 inch elliptical burned area covered with stones, bones, and intermingled ashes, and containing the burned nest of a muddauber. Nearly 6 inches of fire-reddened soil underlay the hearth, testifying to its long use.

Much of the east half of this hearth had been neatly cut away in the digging of a deeper pit or basin, whose bottom just reached the blackened surface 21 inches underground. This basin was circular, with a diameter of 25 inches and a depth of 9 inches; the walls curved in slightly at the top, and joined the slightly concave floor in an even curve. The north half of the wall had been burned to a light brick red, and the floor was fire blackened and hard. Nothing of interest was found in the mixed fill of the pit.

The relationships of these two hearths to one another and to the nearby strata are quite clear. Both are slightly later in time than the bone layer, which was traceable just below the shallow oval fireplace and around the top of the deeper pit. The pit was evidently the last feature on the spot, since it was cut through the shallow fireplace and the bone layer, but from a surface about 12 inches lower than the present slope. If, as seems likely, this bone layer is a continuation of that seen near the top of the trench in O19:16 and O19:21, then the two hearths are probably also somewhat later in time than the large hearth (?) in the "dark sandy soil" in O19:21. There is an element of uncertainty in these correlations because our excavations in area C were not continuous and there is no way of ascertaining at this moment what significant soil changes, if any, occur in the intervening unexcavated blocks.

Correlation of the findings in area C with those in areas A and B rests primarily on the artifacts recovered, because there is no connecting trench that permits direct tracing of soil and cultural strata from the terrace flat down the slope. Insofar as artifacts from area C are of diagnostic character, as is the case with some of the pottery, the chipped implements, and other artifacts, they conform generally to what we found in the Occupation A stratum on the flat. Absence of any trace of house units suggests that for habitation purposes the Indians avoided the lower-lying sandy slope, though they evidently found it convenient for outdoor cooking or temporary camping activities. The time differences indicated by intrusive pits, superimposed hearths, and other features thus are probably of short duration, and result from shifting centers of culinary activity during a brief span of village existence. At any rate, no great time lapse or noteworthy culture change is indicated by our evidence.

There is nothing in area C definitely attributable to Occupation B, though the possibility remains that the broken animal bones, lenses of burned soil and lumps of charcoal scattered 3 to 4 feet deep in the main trench below the "dark sandy soil" should be so identified. As a cultural stratum, however, this material is far less convincing than the Occupation B horizon on the flat to the south. The chips, charcoal, and patches of burned earth can be explained on other grounds than those of camping activities on this particular spot, and bison bones occur in many places in the sandy banks of the creek where human introduction can be ruled out. The lenses of fine and coarse sands and gravel suggest deposition by a swift-running stream, and it does not seem probable that Indians would have camped on a spot so low as to be liable to flooding. In short, while these deeper materials may correspond to Occupation B on the flat, convincing evidence in support of such a conclusion is not at hand.

As already noted, we made numerous test pits on the terrace in addition to the excavations discussed above as areas A, B, and C. In some of these the stratification was less clear cut, and one or the other of the occupation strata seemed to be missing or at any rate could not be certainly recognized. For the most part, however, they confirmed the presence of two separate horizons; in no case, did they contradict or reverse the sequence. There seems no good reason, therefore, for detailing the findings in each pit dug. It is worth noting perhaps that a test pit 125 yards due south of area B, on the edge of the steep south slope of the terrace, disclosed a considerable thickening of the subsurface strata. The upper horizon was about 7 inches thick and contained the usual chips and bone fragments. Below this, to a depth of 39 inches, was light-colored, culturally barren, soil. From 39 to 78 inches was a dark stratum marked at the bottom with a layer of massed animal bones apparently deposited on a flat occupation (?) surface. There were no artifacts from this lower dark layer, and its tentative identification with Occupation B rests primarily on its stratigraphic position. I can suggest no explanation for the marked thickening at this point of the dark layer and of the sterile overlaying deposit.

### AREA D

The excavations here considered were on the south terrace, immediately upstream from that on which areas A, B, and C were located, and due west of the principal spring. This terrace lies just below the point where Salt Creek enters the former Pottorff property, and was pointed out to us as the one from which iron and copper artifacts, glass beads, shell-tempered sherds, and others reminiscent of Pawnee wares were collected in past years. Areas of dark bone-littered soil were visible, and two small knolls at the northwest edge were besprinkled with flints, sherds, bones, and other camp refuse. We were informed that at one time these knolls were much more conspicuous, seemingly being made up in considerable part of midden deposits; but repeated plowing, together with persistent digging for "relics," has almost obliterated them. Tests in various parts of the terrace disclosed no convincing evidence of stratification comparable to that on the main terrace, though sherds collected on the surface from time to time represented wares closely comparable to those identified with occupations A and B.

Area D, situated near the knolls noted above, was slightly more than 200 yards southwest of areas A and B, and about 25 yards from the left (south) bank of Salt Creek. It lay entirely within square J45 of the grid system set up for the main terrace, and covered approximately 250 square feet. A trench 2 feet wide and 35 feet long was dug along the north edge of the square, disclosing flint chips and animal bone in the upper 6 inches; below this, the soil at both ends of the trench showed no cultural admixture. Near the middle, however, and extending southward from units 3 and 4 into units 8 and 9, and lying just below plow sole, was a dark stratum generously littered with burned earth, charcoal, sherds, scrapers, projectile points, bones, etc. This detritus covered an area of approximately 9 by 12 feet; it suggested deposition on a cleared surface, but no postmolds or hearths indicating a habitation were noted. Possibly correlated with this feature was a basinlike pocket filled with bones and charcoal, 36 inches across by 16 inches deep, which was exposed in the north wall of the trench. Below this detrital area, from which came numerous sherds of a partially restorable cord-roughened jar, was an unmixed light-colored sandy soil with faint bedding lines sloping downward toward the north. There was some scattered charcoal in this formation, but nothing to indicate human agency until a depth of 42 inches had been reached. Here another thin fire-darkened seam showed up in the south wall of the trench. This was followed southward into units 8 and 9, where an area about 8 feet square was cleared off. The central feature was found to be a large shallow ash-filled fireplace measuring 40 by 53 inches, underlain by 2 or 3 inches of hard fire-reddened earth. Flint chips and bones were mixed with the ashes; about the hearth, on the darkened living surface, were scrapers and other chipped flints, shell fragments, the base of a 5-notched projectile point, bone fragments, etc. This material thinned rapidly away from the fireplace but its full extent could not be worked out in the time available to us. It seems improbable, however, that a house pit was represented, since careful scrutiny of the trench profile to east and west showed not the faintest indication of an upturn or pit wall. Presumably, this lower hearth, and the detrital area nearer the ground surface as well, are to be regarded as outdoor cooking areas or as the sites of temporary shelters which were not sunken below their contemporary ground surface.

As to cultural allocations, the pottery and stonework from the upper detrital area correspond to the artifacts of Occupation A on the main terrace. There were no sherds associated with the lower hearth area, but the five-notched projectile point fragment and the scrapers again point strongly to Occupation A types. Sherds and flints of Occupation B type were conspicuously absent from this entire excavation area. It is suggested, therefore, that this particular spot on the north edge of the south terrace was inhabited on at least two separate occasions by peoples closely allied culturally with Occupation A on the main terrace. On both occasions a relatively short stay, measurable perhaps in terms of days or weeks, is indicated. There is no way of judging the length of time required for accumulation of the sandy strata between the two habitation levels in area D. I doubt that more than a few decades, at most, are called for, but this is only a guess.

### OTHER EXCAVATIONS

Considerable effort was expended in testing the third and fourth terraces, downstream from the two whose examination has been described above. Some surface material was present on both, and there can be no doubt that they were used at least for temporary campsites. The superficial remains seen, however, were mainly flints, shell fragments, and other nondiagnostic items; sherds, projectile points, and other artifacts with identifiable cultural affinities were extremely rare. Also, the plowed topsoil nowhere showed as persistent admixture as characterizes the two south terraces, and the Occupation A deposits, if they were ever present, appear to have been pretty completely removed. On the northernmost terrace tested, i. e., the fourth of the series north of the property line, a dark soil zone was found at a depth of 4 feet. From this came quantities of charcoal, and in one test, a thick cord-roughened rimsherd of Occupation B type. Nowhere, however, did we tap a sufficiently rich concentration to warrant a larger excavation.

Tests were also made on the gentle valley slopes west of the creek, with negative results; and in so-called "tipi-circles" on the upland just east of the two south terraces. These "circles," 10 to 20 feet in diameter, were shallow and less regular than the usual symmetrical sink holes of the region. Not the slightest evidence of fireplaces or floor lines was found nor was there any cultural admixture whatsoever despite tests to a depth of 4½ feet. The "tipi-circles" here are obviously not of human origin. Examination of a prominent rocky knoll a short distance southeast of the main spring, where glass beads are said to have been found, disclosed no indication of a possible burial, cache, or habitational area.

### ARTIFACTS FROM OCCUPATION A (UPPER REPUBLICAN ASPECT)

#### FOOD REMAINS

No traces of charred corn, beans, cucurbits, or other plant food remains, wild or domestic, were noted. In view of the fact that we opened no cache pits of any size, this is not surprising, though it might be expected that some bits of carbonized vegetal foodstuffs would have found their way into the middens. Certain it is that the Indians must have utilized wild plums, chokecherries, and other native fruits. Whether they also planted corn, beans, and squash on the creek bottoms, there is no way of ascertaining. The bison scapula digging tools may be cited as indirect evidence of cultivation, but they had other uses as well and are obviously not conclusive proof of crop tillage. That the Upper Republican peoples of Nebraska were semihorticultural has been amply demonstrated, and it is reasonable to suppose that a similar maize-bean-squash-sunflower economy was practiced at the Pottorff site unless a temporarily occupied hunting camp is indicated.

In marked contrast to the absence of vegetal remains were the quantities of animal bone scattered through both occupation levels, as well as over the terrace surface. With few exceptions, the bones were badly broken and slivered, so that identifications for the bulk of the material were impossible. Identifiable pieces from the upper level, most of them from the refuse filling the house pits, included approximately 150 bones of bison (*Bison*), 17 of prairie dog (*Cynomys*), 3 of deer (*Odocoileus*), and one each of pronghorn (*Antilocapra*) and badger (*Taxidea*). Five bones identified as dog (*Canis familiaris*) or coyote (*Canis latrans*) and two attributed to wolf (*Canis lupus*) are of uncertain provenience.

The tibiotarsus of a ruffed grouse (*Bonasa umbellus*) came from the refuse in house 1, several inches above floor level.

Molluscan remains, though very much less abundant than animal bones, were also scattered everywhere throughout the stratum. They, too, were generally broken up beyond hope of identification, and evidently were very seldom fashioned into artifacts. Supposedly the shells represent refuse from the food quest. Specimens of the following species have been identified, the last four from the deep sand lenses in area C:

| | |
|---|---|
| *Uniomerus tetralasmus* (Say) | 3 |
| *Pleurobema coccineum* (Conrad) | 3 |
| *Ligumia subrostrata* (Say) | 3 |
| *Quadrula pustulosa prasina* (Conrad) | 1 |
| *Lasmigona complanata* (Barnes) | 1 |
| *Succinea grosvenori* (Lea) | 1 |
| *Sphaerium sulcatum* (Lamarck) | 1 |
| *Physella hawni* (Lea) | 1 |
| *Helisoma anceps* (Menke) | 1 |
| *Helisoma trivolvis* (Say) | 1 |

### POTTERY

Potsherds were nowhere plentiful on the site, and as a rule they were of small size. Fortunately, the great majority of those from the upper stratum are easily recognizable and of a well-known Central Plains ware. About 600 sherds were recovered, but at least one-fourth of these belonged to a single badly shattered jar from the south terrace excavations. Of the remainder, 44 were rimsherds, and it appears that these represent between 20 and 30 vessels.

Characteristically, the sherds have a fine compact paste, gray in color, with granular fracture. Inclusions consist of rounded sand or gravel particles, from 0.5 to 4.0 mm. in diameter (average ca. 1.5–2.5 mm.), and sparingly to moderately used. Surface hardness is about 4, and the sherds are resistant to crumbling, wet or dry. Interior surfaces of sherds are irregularly smoothed, uneven, and striated, with little care manifested in finishing below the neck. Exterior surfaces are invariably roughened with a cord-wrapped paddle; the cord impressions (pl. 60, *i*, *j*) are moderately fine, from 1 to 1.5 mm. apart, commonly crisscrossed or in blocks oblique to one another, and often have been partly obliterated by rubbing. Surface colors are predominantly a dirty gray, rarely buff, tan, or orange-brown, usually lighter in tone on the inner surface.

There are no complete or wholly restorable vessels, but at least three partially restored segments indicate the presence of full-bodied jars with collared rims, constricted necks, flattish or slightly curved upperbody, and rounded shoulders placed rather high on the vessel. In all these particulars, the vessels seem to have approximated closely in form and proportion the typical Upper Republican jars of southern and south-central Nebraska (Wedel, 1935, p. 186 and fig. 4; Champe, 1936, pl. 1A), but I would judge that the Pottorff specimens were mostly of smaller size. None of our restored segments, when the arcs are projected, indicate a maximum diameter in excess of 22 to 25 cm. Vessel walls are from 2.5 to 7.5 mm. thick, averaging near 5 mm.; maximum thickness occurs at the neck, rim collar, and base. The absence of handles, lugs, and other special features is noteworthy. In one of the partial restorations that include two large rim segments from opposite sides of the jar, a hole has been drilled through the neck wall in each piece. The holes were not for crack lacing; and since they seem to have been oppositely placed, they may have been intended for fastening of a cord for suspension.

The 44 rimsherds, when pieces probably or certainly from the same vessel are considered as one, evidently represent about 28 rims. Of these, 15 are unthickened, and represent simply the slight terminal outward flare of the vessel wall. Six of these, in terms of lip treatment, are undecorated. Several have crossed incisions producing a diamond motif along the lip; two have short diagonal incisions, one is faintly cord impressed, and one is scalloped. Thirteen rims, seen in cross section, are more or less wedge shaped, i. e., thickened from the lip downward to give the effect of an overhanging collar and thereby accentuate the constricted neck. Various decorative treatments occur on the panel between the vessel lip and the lower edge of the collar. Five have faint traces of vertical cord roughening; on two there are hatched triangles alternating with plain ones above a scalloped edge; parallel horizontal incised lines, 3 to 5 in number, with short incised diagonals or molded scallops along the lower collar edge, occur three times; incised crosshatching, a chevron motif above nipplelike nodes, and a crudely scrawled rectilinear pattern occur once each (fig. 77, *a–c*). Virtually every one of these collared and incised pieces (pl. 60, *a–e*) can be duplicated by characteristic Upper Republican sherds from southern Nebraska sites (Wedel, 1935, fig. 6), where unthickened as well as collared rims are also found.

Quite distinct from the preceding, is a series of some 75 sherds from area C on the north slope of the main terrace. In these, the paste is very dark gray and friable, sparingly tempered with fine gravel, and is much softer than the Upper Republican sherds. Thickness varies from 7 to 8 mm. Exterior surfaces are unevenly smoothed and plain, interiors are pitted and uneven. Vessel shapes are unknown; it is possible all the fragments are from a single large jar. There are several fragments of thick vertical rim about 2 cm. high with plain rounded lip; the neck area seems to have been striated or brushed; and there is a suggestion of a slight angular shoulder on two or three sherds. In color, texture, and friability of paste, these sherds bear some resemblance to a rocker-roughened sherd found below house 2 in area A, unquestionably associated with the lower occupation stratum; otherwise, they do not resemble any recognized Central Plains ware with which I am familiar. No sherds of this type were found in either of the houses, though, as suggested elsewhere, most of the materials encountered in area C are believed to correlate with those in area A.

### OBJECTS OF BONE

*Scapula digging tools.*—Fragments of dressed and use-worn bison scapulae, believed to have been parts of digging implements, were noted at various points in our excavations but were nowhere plentiful. Their exact form, size, and modifications, if any, for hafting are conjectural, since our material indicates little beyond the fact that the scapular spine and other surface irregularities had been removed, the vertebral border sharpened, and most of the blade polished by prolonged use. Rather small rounded blades seem to be indicated, but this again is uncertain.

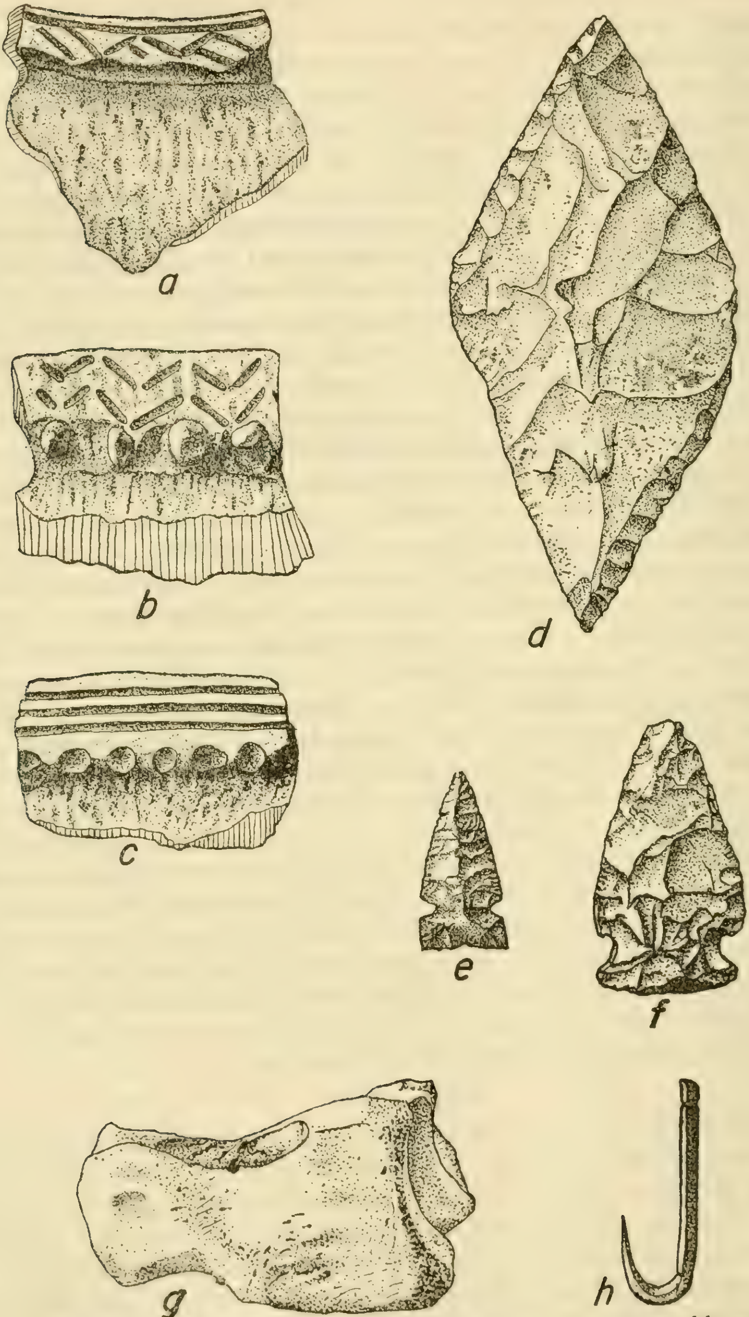

FIGURE 77.—*a–c*, Collared rimsherds; beveled knife and projectile points, and bone objects from Occupation A (Upper Republican Aspect), Pottorff site.

*Ulna pick* (?).—The distal extremity of an incomplete elk ulna, 235 mm. long, is rounded and smoothed by wear, are tip fragments of two other ulnae. These possibly represent digging tools used in lieu of a pick or mattock for breaking up hard soil.

*Awls.*—Ten of these were found, only three of them certainly complete. These three were made from split mammal leg bone (pl. 61, *h*, *i*); in one, the head had been unmodified after the original splitting; in another it had been partly worked down; and in the third, the head had been cleanly detached by cutting and snapping off. All were well finished, though somewhat etched by soil acids or root action; and they varied in length from 87 to 146 mm. Four others, 58 to 84 mm. long, were fashioned from splinters of leg bone by grinding down one end, with the other end left ragged and unfinished (pl. 61, *k*–*l*). Two, 75 and 80 mm. long, are made of rib splinters, likewise with unfinished butts and with one side showing a strip of cancellous tissue. The remaining specimen, and possibly two or three other short fragments, appear to be from the shaft of dressed legbone awls, but they are too small to be decisive.

*Fishhook.*—This is a slender well-made piece cut and ground into form from the wall of some unidentifiable mammal bone; one side still shows traces of cancellous tissue (pl. 61, *c*). It is 37 mm. long, with a width across the lower part of 13 mm.; the shank is about 2 mm. thick by 3 to 4 mm. wide, with a 1-mm. encircling groove about 4 mm. from the end. There is no barb, but the bend has a slight twist so that the point is not exactly in the same plane with the shank (fig. 77, *h*).

*Worked phalanges.*—Three otherwise unmodified bison phalanges have irregularly elliptical openings hacked through one wall to the interior (fig. 77, *g*). Two specimens have the hole on the anterior, the other on the posterior, surface; none shows any attempt at smoothing or finishing the opening, or at penetrating both walls. The holes were made with a picklike or chisellike implement, rather than by a boring or drilling tool. Similarly worked objects have been reported from sites of the Upper Republican (Wedel, 1935, p. 202) and Woodland (Hill and Kivett, 1941, p. 163) horizons of southern Nebraska.

*Tubular beads.*—Six tubular beads (pl. 61, *d*, *e*, *g*) range in diameter from 7 to 9 mm.; three are 16 to 21 mm. long the others 39 to 53 mm. They are straight, smoothed at the ends and generally well finished, though most have an "etched" surface. The longer specimens show traces of cancellous tissue at each end of the bore, and all are of moderately heavy bone which is probably of mammal, not avian, origin; contours of some of the pieces suggest the shaft of a canid toe or foot bone. Two or three toe-bone extremities, with one clean-cut end, are probably refuse from bead manufacture.

A seventh bead, 5 by 18 mm., is apparently of bird bone. Two deep encircling grooves divide the specimen (pl. 61, *f*) into three equal segments, and the surface is polished from use. There is some resemblance to the segmented beads of the lower Kansas valley (p. 204), except that the cuts in this specimen are deeper than those characteristic of the beads of the Manhattan area.

*Miscellaneous pieces.*—Two articular extremities of mammal leg bone, both detached by deep cutting and snapping off, are undoubtedly rejectage, perhaps from awl or bead manufacture (pl. 61, *a*). There is also a small object of parallel-sided, flattened elliptical bone with one square-cut end, the other broken; it measures 22+ by 9 by 3 mm., has well-worn surfaces, and its use is unknown.

The only example of worked antler is a much weathered section showing a diagonally cut and smoothed transverse surface. It is too small to identify as to use, if there is any.

### OBJECTS OF CHIPPED STONE

Chipped stone artifacts, whole and broken, were found in some quantities throughout the site, possibly in somewhat greater profusion than is customary in Upper Republican village sites. Some of the objects are well made, but in the range of types and in the workmanship displayed, the local industry falls short of that manifested in the protohistoric Rice County sites. Materials used include a wide variety of brown, tan, and gray cherts, with some chalcedony, moss agate and jasper, but, so far as our work went, no obsidian. The banded foraminiferous Florence flint, so characteristic of Rice County sites, was also absent. Source of the materials I cannot specify, though much of the stone may have come from whatever cobbles of cherty material were available in the Tertiary or later gravels of the locality.

*Projectile points.*—Excluding surface finds, 142 projectile points were recovered, about two-thirds of them in and about the two house sites. Of these, 6 can be classed as stemmed; the others are basically triangular in outline, with or without notches (fig. 77, *e*).

Trianguālar points, whether notched or not, are generally well made and symmetrical, with 90 percent or more retouched equally on both faces. In none are the edges serrate. In size, they are 15 to 46 mm. long, 12 to 22 mm. wide, and 2.5 to 4.5 mm. thick; the width-length ratio varies from 1:1 to 1:3, with an average of about 1:1.8. Simple unnotched triangles, usually with slightly convex edges (pl. 62, *b–d*), number 68 specimens. They are much more variable in size than the plain triangular points of the protohistoric horizons of central and western Kansas, and include most of the larger and thicker unstemmed points (over 36 mm. long) from the Pottorff site.

Notched triangular points, in several varieties, also number 68, and include most of the better made points from the site (pl. 61, *f–k*). Thirty-one have a single pair of lateral notches 3 to 6 mm. above the base; 27 have, in addition to the lateral notches, a single notch in the base; 5 have two pairs of lateral notches; and the remaining 5 have two pairs of lateral notches and a single basal notch. In the last two groups, one pair of notches, usually that nearest the base, tends to be smaller than the other, sometimes little more than a suggestion.

The rare stemmed or corner-notched points from the Upper Republican horizon are generally small; but with breadth and thickness somewhat greater in relation to length than among the triangular points. They are quite well made, however, and the quality of workmanship displayed is obviously much closer to that on the triangular points than to that on the larger rougher points from the underlying stratum. Representative examples are shown in plate 62, *e*, *l*, *m*.

From the surface of the site came 19 additional points, two of them heavy stemmed Woodland-like forms 46 and 59 mm. long. Of the remaining 17 triangular specimens, 9 were unnotched, 8 were notched, and all were well within the range of size and craftsmanship shown in the excavated specimens.

*Drills.*—Chipped drills were surprisingly scarce; the excavations yielded 2 or 3 examples, and there were 4 from the surface. There is a thin well-made T-shaped drill of brown jasper from the diggings (pl. 62, *n*); it is 32 mm. long, 15 mm. across the base, and the tip is broken. The base of a second similar specimen, 19 mm. across and having about 4 mm. of the stem, was also uncovered. A third specimen has a short point expanding to a wide straight base; it is 18 by 10 mm., and suggests a retouched triangular projectile point.

Surface finds include three fragmentary drills, of expanded base type; and one complete example with heavy corner-notched base (pl. 62, *o*) and short stout point. This piece measures 46 by 31 by 7 mm., is of brown chert, and is possibly a retouched projectile point of Woodland type.

Three spalls, each with edges retouched to give a gradually widening tip may be reamers or perhaps graving tools.

*Knives.*—Bifacially chipped blade fragments showing evidence of some care in shaping were quite numerous; the probable range in forms may be judged from the series of whole blades shown in plate 63, *a–g*. Diamond-shaped four-edged knives, with adjoining edges oppositely beveled, were certainly known, though they were not fashioned with very great skill or regularity and the beveling tends to be weak (pl. 63, *a*, *b*). In addition to the whole specimens illustrated there were less than a dozen subtriangular fragments with two converging oppositely beveled edges and the third side obviously fractured, all suggesting this same "Harahey" type. The complete specimens are 90 by 31 by 8 mm. and 102 by 48 by 9 mm.; the largest beveled fragment is 85 by 53 mm., and if from a 4-bladed implement this must have been considerably larger than either of the whole pieces.

More numerous than the beveled knives, apparently, were elliptical, ovate, or leaf-shaped implements (pl. 63, *c–g*), with one or both ends rounded and the cutting edges convex. Our collections are too limited to indicate with finality what form or forms were preferred and their respective abundance, but as the illustration suggests, the several shapes probably intergrade. These knives are 7 to 12 mm. thick, 30 to 57 mm. or more wide, and 50 to 90 or more mm. long. Retouching varies, of course; on some specimens it is fine and regular, on others, coarse and uneven.

Two leaf-shaped objects of dark-gray plagioclase basalt, each with one end broadly rounded, the other pointed, are either small knives or else artifact blanks. They are 55 by 33 by 7 mm. and 62 by 40 by 8 mm.

*End scrapers.*—Upward of 200 whole and broken end scrapers were found. All have in common the planoconvex cross section with a wide rounded steeply chipped working end, and a narrow tapering "tail" (pl. 62, *p–s*). There is the usual variability in details of form, relative thickness, etc. Size ranges from 22 by 17 by 4 mm. to 62 by 25 by 11 mm. Of 185 specimens sorted by length, 48 (about 26 percent) are under 30 mm., 108 (58.4 percent) are between 30 and 45 mm., and 29 are over 45 mm. long. Though this breakdown is not strictly comparable with that for other sites in central and western Kansas, as presented elsewhere in this report, it can be stated that the scrapers from Pottorff are somewhat larger and heavier than those from protohistoric sites of the region.

*Side scrapers.*—These were much less plentiful than end scrapers, there being not more than 50 examples. They were fashioned from spalls and flakes of varying sizes and shapes; each has one flat, curved, or "twisted" plane surface, the other being convex and often showing several long flake scars. Retouching was confined to the edge, and was always on the convex surface. Some of the smaller specimens approximate the prismatic flake knives in size and shape; others are much larger and rudely shaped, none showing the careful workmanship of the knives. In size they range from 51 by 18 mm. up to about 80 by 40 mm.

*Large chipped implements.*—There are about a dozen large heavy coarsely chipped objects, varying from more or less ovoid axlike or celtlike implements (pl. 63, *h–l*) to broad flat round-ended scraper or hoe forms. They have only primary flaking on both faces; there is no clear evidence that they were hafted, though in a few instances portions of the edges appear to have been ground down somewhat as if to ease the wear on a lashing or handle. The material is either brown jasper or a gray chert, evidently from a seam not more than 25 or 30 mm. thick; several specimens have remnants of the enclosing calcareous matrix on both faces. Most of the implements range from 93 to 150 mm. long, 54 to 86 mm. wide, and 19 to 30 mm. thick; but there is one large broken specimen 185 by 120 mm.

### OBJECTS OF STONE OTHER THAN CHIPPED

*Mealing slabs* (?).—From the refuse-filled house pits came two doubtful fragments that may have come from grinding slabs. One is from the rounded edge of a concavo-convex slab of calcareous quartzite, about 38 mm. thick. Both slab surfaces look worn, but whether from grinding or through some other agency is not clear. The other specimen, of very coarse sandy conglomerate, shows part of a concave upper surface that may have been a grinding basin.

A third piece from the north slope of the terrace is from a flat sandstone slab, 20 mm. thick, with smoothed even surfaces. It appears to be from a much more carefully dressed object than either of the foregoing, but is too small to be conclusive evidence for the presence of mealing slabs. A surface fragment is unquestionably from such a slab; however, its associations are uncertain.

*Manos.*—There is one complete mano or hand stone—a thick subrectangular quartzite block with rounded angles and one worn grinding surface. The nongrinding surfaces are dimpled from hammer-dressing, evidently to shape the object. It is 140 by 85 by 63 mm.

The second piece is doubtful. It is the end of a broken quartzite cobble, with one surface apparently smoothed by grinding. Its original size and shape, like its use, are conjectural.

*Sinew stones* (?).—A quartzite cobble, 90 by 70 by 40 mm., has shallow grooves running lengthwise along the rubbed upper surface, and down onto the rounded edges. The grooves look like the result of prolonged abrasion by soft yielding substances, such as skin, sinew, or a cord, which were drawn back and forth over the stone. The ends are slightly battered, as from use as a hammerstone.

A small fragment from the end of a second quartzite pebble also has a broad shallow groove with subdued striations like the above.

*Rubbing stone.*—This is a planoconvex oblong sandstone block, fire blackened, and showing spotty evidences of abrasion on the somewhat uneven flat surface. It fits the hand conveniently, and may have been used for hide dressing or otherwise on a yielding surface. It measures 108 by 88 by 28 mm.

*Shaft smoothers.*—Less than a dozen shaped sandstone fragments are from longitudinally grooved abrading stones. Most have one surface flattened, the others slightly convex; and the presence of shallow haphazard grooves on 2 or 3 surfaces suggests re-use of fragments for sharpening bone implements, etc. The longest specimen, exact provenience unknown, measures 112 by 26 by 24 mm., and is broken off at one end; the flattened upper surface has a deep straight full length groove 8 to 9 mm. in diameter, with shorter grooves on the other sides. Other fragments are up to 60 mm. long, 25 to 40 mm. wide, and 15 to 30 mm. thick, thus conforming in most particulars of size and form to those found at numerous other Plains sites. The stone used includes both red-brown and grayish-white varieties, all of good abrasive qualities.

There is no direct proof that these implements were used in pairs, as they unquestionably were in historic times, but their general similarity suggests such a method.

*Abrading stones.*—There were several oblong worn blocks of sandstone, with flattened sides and rounded ends, that were probably used as polishing, smoothing, or finishing stones. They were less regular, but relatively broader and thinner, than the shaft smoothers, and in all cases lacked the grooves. Size varies up to about 80 by 45 by 25 mm.

*Stone pipe.*—This is a poorly preserved and fragmentary specimen, of soft friable gray limestone. It appears to have been a simple, heavy, elbow-shaped affair, perhaps 50 mm. high, 35 to 40 mm. thick, with a short square stem-arm not over 40 mm. long. The tapered cavities have been reamed out to maximum diameters of 16 or 17 mm., and the bowl interior is slightly blackened. There is no decoration.

*Hammerstones.*—About 20 variously shaped but more or less rounded stones of quartzite or granite have battered ends, corners, or edges. In occasional examples, this battering has reduced the stones to nearly spherical form. They vary from 65 by 50 by 30 mm. to 100 by 60 by 45 mm. To what precise use they were put is not clear, but in view of the relative scarcity of pecked and ground stone objects, I would suspect they were employed perhaps in the primary shaping and roughing out of stone knives and heavier chopping or skin-dressing tools.

*Stone phallus.*—From a small test hole on the south slope of the main site terrace was taken a simple carved block of faintly laminated metamorphic stone. The block is squarish in cross section with rounded corners, and at one end becomes more bulbous and down curving. At the extreme tip there is a short deep vertical cut; and on each side of the bulbous portion, there is an oblique incision beginning on the underside and rising to intersect the opposite incision on the upper side. The piece is an unmistakable representation of the male generative organ. It is 136 mm. long, 39 mm. wide, and 35 mm. thick (pl. 56, *k*).

*Worked amazonite.*—From a small shallow test near the west end of the terrace came a triangular bit of flattened dressed stone, with two broken edges and one curved. The material, a pale robin's egg blue, was at first mistaken for turquoise, but has since been identified as amazonite. It probably is a fragment from a small pendant.

*Pigments.*—A few lumps of red-brown hematite and yellow limonite, with striations, grooves, and grinding facets undoubtedly indicate the source of some of the paints used by the natives.

*Concretion.*—A single marcasite concretion, flattened circular in shape and measuring 37 by 59 mm., was found. Its surface looks somewhat worn, but from what sort of usage I am unable to say. These concretions are at present weathering in quantities from the shale beds bordering Salt Creek just below the main terrace, and this is undoubtedly the source of the specimen we found. They occur rather plentifully in the refuse deposits at the protohistoric Scott County Park site ("El Cuartelejo"), as will be noted elsewhere.

### OBJECTS OF SHELL

*Pendants.*—From area B, east of the house sites, came two rather irregular pieces of mussel shell drilled for suspension (pl. 61 *o*, *p*). One is elliptical with well-worn rounded edges; it is 40 by 22 mm., with a 4-mm. perforation. The second piece is roughly triangular, and includes part of the hinge; it measures 36 by 27 mm. Neither piece is decorated.

*Disk bead.*—A single circular bead, 14 mm. across by 2 mm. thick, biconically bored, was found on the surface. Its relationship to the Upper Republican stratum is not clear.

## ARTIFACTS FROM OCCUPATION B (WOODLAND)

### FOOD REMAINS

There were no traces of domestic or wild plant food from the lower level of the site. It is a safe guess, of course, that these Indians, as well as the later ones, made extensive use of the available berries, fruits, roots, and other food in and about the creek valley. That they also grew corn, beans, or squash seems rather less likely, since suitable digging tools have not been found, and the single muller could as well have served to crush berries. That corn and beans were known on this general time level is evident from the finding of charred corn in a Nebraska Woodland site and also at the Renner site near Kansas City (Wedel, 1943, p. 26), but that it was actually grown and used on the Pottorff site cannot be demonstrated. The feeling persists that this was primarily a hunting station.

Identifiable refuse bone from this level was not very plentiful, though slivered and broken bone was everywhere present. Bones recognized included the following: bison, 7; antelope, 16; white-tailed deer, 9; kit fox, 1; dog, 1; wolf, 1; coyote,10; prairie dog, 25; cottontail rabbit, 5; black-tailed jackrabbit, 3; badger, 1. Our sample, of course, is small; but it is interesting to note the relative prominence of antelope, deer, and other small forms over bison, whereas bison overwhelmingly predominated in the upper level. The possible significance of this difference, observed also in certain Nebraska localities, is discussed elsewhere in this paper.

Bird bones apparently from this level represent three species: the golden eagle (*Aquila chrysaëtos*), blue-winged teal (*Anas discors*), and red-tailed hawk (*Buteo jamaicensis*). All were at depths of 12 to 24 inches in area B, but unfortunately where there had been some disturbance by rodents. The possibility that these bones actually belonged to the later occupation cannot be entirely ruled out.

Molluscan remains were not plentiful, although bits of shell were encountered rather frequently. Specimens of the following two species, both locally obtainable creek forms found also in the upper level of the site, have been identified:

| | |
|---|---|
| ***Ligumia subrostrata*** (Say) | 6 |
| ***Pleurobema coccineum*** (Conrad) | 1 |

### POTTERY

From the lower occupation level there are but 95 potsherds, including 5 rim fragments and 90 body sherds. There are no duplicates among the rims, from which it can be concluded that at least five vessels are represented. Most of the sherds are small, though the occasional larger ones considerably exceed in size any of those from the upper level. Our work does not suggest that these earlier peoples were so well provided with earthenware as were their successors; the sherds were widely scattered, and matching or restoration of any of the pieces is impossible. Had we been able to locate a refuse deposit for this horizon, as we did for the overlying stratum in the abandoned house pits, it is possible our labors would have been more generously rewarded.

The pottery in general is readily distinguished from that of the Upper Republican stratum, and appears to conform closely to Kivett's (1953, p. 131) Harlan Cord-Roughened type in Nebraska. Eighty sherds are tempered with coarse angular particles of crushed calcite, from 1 to 7 mm. in maximum dimension; silicious matter is very scarce or absent. The calcite inclusions are usually present in abundance, and can be readily seen with the unaided eye; occasional sherds are so thickly tempered that inner surfaces appear to be sprinkled with shell particles, and leaching sometimes imparts a very irregular pitted or "hole-tempered" effect. The fracture surface is granular, its coarseness or fineness depending upon the texture and abundance of the aplastic. Hardness very rarely exceeds 2.5 (apatite), and the sherds are much softer, more friable, and far less resistant to water than the Upper Republican materials. In color the paste varies from light gray or buff to almost black on a fresh break, with considerable variation in a single sherd. The surface color now, even after washing, is a very light gray but this appears to be due to a calcareous patina deposited by ground waters (pl. 60, *l–n*).

Almost without exception the sherds bear closely spaced cord-impressions on the exterior surface; the impressions are usually wider and deeper, and often more closely spaced, than those on Upper Republican sherds (cf. pl. 60, *i*, *j*, and *l–n*). From the sherd contours, I suspect the impressions were generally vertical on the vessel, and they seem to have been continuous over large areas. Two sherds from area B have deep single-line fabric (?) imprints separated by narrow sharp partly overhanging ridges. Casts in clay of these imprints resemble strings of small beads; they do not suggest knotting or a wrapped implement or twisted element. There is some resemblance, too, to twined basketry impressions, though the placement of the markings and their depth argue against such an identification.

Little evidence exists as to vessel shapes, but there is one fragment unquestionably from a tapered subconoidal base. The very slight curvature shown by most of the sherds further suggests jars of considerable height and girth, but their proportions remain conjectural. Vessel walls ranged in thickness from 7 to 15 mm., well in excess of the figures for our Upper Republican sherds. Rims, of which there are four, appear to have been vertical or slightly flaring, with either rounded, or flattened and slightly thickened, lip; cord impressions occur on two lip sherds. There is no evidence of handles, lugs, effigies, or other modeled features, or of incising.

Fifteen sherds differ somewhat from the foregoing series. They are tempered with noncalcitic rounded particles of grit, from 0.3 to 2.0 mm. in diameter, and sparingly to moderately abundant; the freshly fractured surface is finely granular, with a fine, dense, even paste. Hardness is 3 (calcite) to 4 (fluorite), and color is light buff to dark gray. Six sherds have deep closely spaced vertical cord impressions on the exterior; four have widely spaced (2–3 mm. apart) cord impressions on the exterior with partly obliterated imprints on the interior as well; and four have plain somewhat unevenly smoothed surfaces. Thickness of sherds is 6 to 11 mm. Vessel shapes again are uncertain; the single rimsherd in the series has a plain rounded lip, with cord impressions ending 6 to 10 mm. below on the exterior surface.

Mention has already been made of the finding of a rocker-roughened sherd 9 inches beneath the floor of house 2. This piece (USNM 387276) has a fine black paste, tempered with fine sand particles, and with a surface hardness of about 4. The uneven interior surface was heavily encrusted with carbonized matter; the exterior was unevenly smoothed. The sherd (pl. 60, *k*) is crossed by a narrow curving incised or trailed line separating a plain portion from a decorated area. The latter consists of two rows of apparently vertical edentate rocker impressions, each curved impression up to 15 mm. long. The decoration is sloppily done and the pattern, of course, is unknown, but the technique seems clear enough. None of the vessel rim is present, and the original shape and size of the jar are conjectural. The rocker stamping, though crude, recalls that on Hopewellian sherds from the Kansas City district (Wedel, 1943, pp. 29–41). The very dark, finely tempered, sooty paste, however, suggests neither Kansas City Hopewellian nor such local western Plains Woodland wares as I have seen, but rather certain sherds from the Andrew Snyder village site, Calhoun County, Ill., recently presented to the National Museum by P. F. Titterington.

### OBJECTS OF BONE AND SHELL

Worked bone and shell from the Occupation B level was very scarce; in fact, only four artifacts made of these materials were found. Just outside the northeast edge of house 1, probably in the refuse below floor level at a depth of 16 to 22 inches underground, were found two partly pierced bison phalanges. In both, part of the posterior surface of the bone has been crudely hacked away to form a large irregular oblong hole into the marrow cavity. The holes are 16 and 25 mm. long; their margins show no evidence of smoothing or finishing, and the bones are otherwise unmodified. The specimens closely parallel those from the upper level, described in a preceding section, as well as a series from a Woodland site in Valley County, Nebr. (Hill and Kivett, 1941, p. 163). Their use is unknown (pl. 64, *b*).

In area B, at a depth of 16 inches, was found the awllike object illustrated in plate 61, *m*. Made of split mammal legbone, it has one rounded and one pointed end, both somewhat chipped. The surface, where not "etched," shows traces of high polish, and the edges have been dressed. Along one edge are 18 notches at 2 to 3 mm. intervals. The specimen is 74 by 9 by 4 mm.

Also from area B, at 18 to 34 inches depth, came a small fragment of worked fresh-water mussel shell. The piece is irregular in shape, measures 26 by 30 mm., and on a short section of the original ventral margin there are 4 notches at 4- to 5-mm. intervals. Excepting the notches there are no evidences of modification, and I am unable to say whether the fragment is from a simple serrate ornament or from a utilitarian object (pl. 61, *n*).

### OBJECTS OF CHIPPED STONE

Chipped-stone artifacts were nowhere plentiful in the lower occupation stratum. By comparison with the more abundant materials from the upper level, Occupation A, they were, moreover, less skillfully fashioned and more roughly finished. With few exceptions, the objects represent spalls, thick chips, and cores, with but an occasional piece made from the thin delicate flakes used so extensively by the later peoples for projectile points, drills, and other small objects. Chipping varies in coarseness, and even on blade edges is never so fine and regular as that on the upper level artifacts. Jasper, dark-colored cherts, and quartzite are the principal materials used; chalcedony, moss agate, obsidian, and variegated cherts, which lend a pleasing variety to the products of the later peoples, are rare or absent.

Seven complete and fragmentary projectile points were taken from the lower cultural stratum. Five are corner notched or stemmed (pl. 64, *f–h*), with well-marked shoulders, expanding stem, and convex, or in one case concave, base; blade edges are slightly convex. Complete specimens are 35 to 76 mm. long, 22 to 28 mm. wide, and 5 to 9 mm. thick. One of the specimens, plate 64, *h*, has a rounding tip which does not look like mere retouching of a broken projectile point, though otherwise the piece is of the same size and general type as the other points. The two remaining points are different. One is a small thin broken triangle about 26 mm. long, with convex sides and slightly concave base. It was found in the upper part of the lower zone near the house pits, but at a point where the two occupation layers touch, and there is a possibility of intrusive entry into the Woodland stratum. Another point, 27 by 16 by 3 mm., has prominent backward-curving barbs, and a short straight-sided stem with straight base. Like the preceding, the technique on this piece strongly suggests the Upper Republican industry and the point occurred in an area crisscrossed with old rodent burrows. Whatever the correct provenience of these two small points, it is clear that a majority of the projectile points from the Woodland stratum are of a larger stemmed form markedly unlike the small Upper Republican points. Two additional heavy stemmed points, in every respect like those described above, were collected from the surface of the main terrace.

Eight planoconvex end scrapers are of small to medium size, conforming in all particulars to the familiar "snub-nose" scraper of the Plains. They are 30 to 52 mm. long by 19 to 25 mm. wide. All are unifacially retouched except one, which has been flaked on the flat ventral surface as well (pl. 64, *i*).

Six side scrapers are also planoconvex but lack the careful overall shaping of the end scrapers. They are elongate, in outline following the conformations of the original spall, and have a long edge, not the end, retouched for working. The largest is 55 by 30 by 8 mm.

Two thin curved prismatic flakes bear two or three flake scars each on the back and have the edge or edges retouched for cutting or scraping. They are 51 to 55 mm. long by 15 to 18 mm. wide.

Of shaped cutting, chopping, or scraping tools other than those given above, there is a notable scarcity. There are several thick oblong to subtriangular objects that suggest chopping tools or unfinished implements. They are fashioned of jasper taken from thin veins in a calcareous matrix. They may be implement blanks; but since they are virtually the only objects from the lower stratum that can be regarded as possibly cutting tools, they should perhaps be classed as celts (pl. 64, *c*, *e*). Rare fragments of thinner pieces, retouched from both sides, may have been knives.

### OBJECTS OF GROUND STONE

From the deep stratitest just south of area B, at 24 to 30 inches depth, came an irregular bun-shaped quartzite cobble. The edges show some evidence of workmanship; the flat underside is well worn, the convex surface less so. The stone measures 100 by 94 by 40 mm., and fits the hand conveniently. It was used, presumably, with a rotary motion. There were no mortars or mealing slabs from this horizon, and I cannot say what substances may have been pulverized with the implement.

There is also a spall from a lump of vesicular basalt, that shows traces of wear. It is thin, but the diameter is about the same as in the above piece. Possibly it was used in hide dressing.

### FUTURE INVESTIGATIONS

There can be no gainsaying the fact that our very limited excavations at the Pottorff site indicate a succession of prehistoric cultures—a succession borne out by other nearby findings that are yet to be considered. The significance of this finding will be considered elsewhere. Meanwhile, it is a safe prediction that other creek valleys in the High Plains region, where permanent springs and sheltered flood-free terraces occur together, can be expected to afford additional instances of such culture stratification. Large or spectacular sites are not to be expected, but there is excellent opportunity for worthwhile findings bearing on the adaption of primitive man to a somewhat trying and certainly variable natural environment. On the basis of our experience, I should like to suggest to future students certain procedures which, I freely admit, we should have put into practice.

In the first place, there is need for a far more precise and extended correlation of cultural and noncultural strata than is obtainable from small-scale and discontinuous excavations such as ours. A master profile trench up to 6 or 8 feet deep, running north and south through the main terrace, and provided with laterals at promising points would probably have solved several intriguing questions at present left open—e. g., the nature of the suggested third and oldest cultural stratum (Occupation C), the relation of the occupation horizons on the terrace proper to the deposits on the slopes, the attribution of the various remains to transitory hunting camps or to semipermanent partly horticultural villages, and the specific nature of the nonhuman agencies that built up the terrace. For this, obviously, more time and a great deal more manpower than we had will have to be available.

Moreover, there should be an interdisciplinary arrangement whereby a qualified geologist, physiographer, or sedimentation expert could be called in for consultation. The necessity for such cooperative endeavors has been voiced before by others; it acquires urgency as the number of known buried cultural horizons and of stratified sites increases. These sites provide tangible proof that primitive man's occupancy of the region has been linked with fluctuations of climate and resultant modifications of the landscape. Few, if any, archeologists have the highly specialized training in geological processes that is required for the study, interpretation, and correlation of stream terraces, yet this phase of the evidence is of unquestioned importance in reconstruction of past climatic conditions and their influence on human activities. I doubt that we shall have more than a very superficial impression of primitive human ecology in the Plains until a combined attack has been made on the geology of a representative series of the prehistoric stratified sites that we now know to exist.

### THE RISSTON SITE (14SC4)

A little less than a mile southwest of the Pottorff site, where Salt Creek swings from a northerly to a northeasterly course before leaving Scott County, three small inconspicuous terraces have been partially or wholly isolated by erosion. They are from 50 to 150 yards north and west of the left bank of the creek, at the foot of a long gentle slope that here forms the west margin of the valley. To the east and southeast are calcareous bluffs up to 50 feet high; at their base is the creek, which has running water up to this point but only occasional permanent ponds above. Hackberry and cottonwood fringe the stream at the base of the bluff, with some prairie grasses on the adjacent valley bottom, but otherwise the gently rolling landscape is dominated by a thin cover of short grass, yucca, and sage (pl. 57, *b*).

The terraces concerned are much smaller and less sheltered against winds than those at the Pottorff site, and seem far less desirable from the standpoint of human habitation. Their surfaces, however, from which a foot or more of plow-loosened topsoil is said to have been blown during the dust storms of 1935 and 1936, are littered with sherds, flints, bone fragments, burned stones, and similar Indian refuse, and the location is a popular one for local collectors from nearby towns. Lesser quantities of refuse are to be found widely scattered over the slopes to the west, suggesting by their amount and diversity the frequent if transitory utilization of the locality by Indians for untold centuries.

Of the three terraces, the isolated central one appeared most promising on a preliminary surface examination, and 10 small test pits were accordingly dug along the midline of its summit. These varied in depth from 22 inches to nearly 6 feet, and were dug a foot or more below any sign of cultural admixture. Such admixture was present in varying amounts in all of the tests, beginning always at the grass line and ending at a depth of 10 to 18 inches below the surface. It consisted of dark-colored soil, mixed with charcoal, bone refuse, burned stones, and rare sherds. Specimens of diagnostic value were extremely scarce. Test No. 5, near the middle of the terrace, yielded a fragment of sandstone or quartzite mealing slab, a pecking stone of black plagioclase basalt, and a large heavy calcite-tempered sherd bearing deep impressions of a tightly twisted cord. In test No. 8, near the south end of the terrace, there came to light a small circular pit 23 inches in diameter by 22 inches deep; the fill contained much charcoal, a tubular bone bead, a thick cord-roughened calcite-tempered sherd, and the base of a heavy stemmed or corner-notched projectile point. The purpose of this pit is not clear; no other suggestions of aboriginal structures were noted, and the artifact yield generally was so low that expansion of the tests was not regarded as worth while.

At the extreme south end of the terrace a small plot of unbroken prairie sod remained. Here, under circumstances that probably more closely parallel the soil conditions prior to modern agricultural development and accelerated wind erosion, we made our tenth test. The uppermost 8 inches consisted of clean light sandy soil, which was underlain by a darker formation containing flint chips, bone fragments, charcoal, and a calcite-tempered cord-impressed sherd. Below this occupation zone came more unmixed soil, which continued downward without break or apparent variation to at least 6 feet. I suspect that the dark refuse-bearing stratum was once similarly sealed in over the entire terrace by a noncultural deposit that has since been removed except in those small spots where the sod cover remains undamaged.

Test pits were also dug on the other two terraces, east and west of the central one, with substantially the same results. In addition, a trench 30 feet long was cut across the south end of the east terrace, whose eroding edges showed an outcropping detrital zone. Here again mixed soil occurred from the surface to a depth of 16 or 18 inches; the fill was very dark in color and contained much charcoal, flint scrap, and bones. Three mullers, two of quartzite, one of very coarse sandstone, and all with a single worn grinding surface, came from the trench; one was bun shaped, one subtriangular, the third subrectangular. Other specimens included the convex base of a brown jasper blade, a calcite-tempered sherd with nearly obliterated cord-roughening, and 10 cord-roughened sherds with rounded gravel or coarse sand inclusions. This culture-bearing zone faded gradually downward into clean unmixed soil which, to judge from auger tests, continued to at least 5 feet.

The surface materials that we collected on the terraces from time to time during our stay in the locality strongly suggest at least two distinct occupations. There are relatively few sherds of the heavy calcite-tempered deeply cord-impressed pottery, and a great many of a thinner, harder ware containing rounded gravel or sand and having a cord-roughened exterior. One or two broadly incised or trailed grit-tempered rim fragments somewhat suggest Lower Loup wares from east-central Nebraska, but are too small to be definitive. Projectile points are of two general types: a small, well-made triangular form with or without notches, and a much larger corner-notched or stemmed form. Of less diagnostic value at present are fragments of mealing slabs and mullers, end scrapers, drills, thick roughly chipped lanceolate implements, and numerous other cutting and scraping tools. Private collections from the site show the same range of artifact forms suggested in our sample, including the two or more distinct pottery wares and projectile point types noted above.

On the basis of our work at the nearby Pottorff site and other findings elsewhere in the Central Plains it seems reasonable to infer that at least two distinct cultures are represented on the Risston site. To one may be attributed the thinner sand-tempered pottery and small notched and unnotched points; to the other belong the thick calcite-tempered sherds and heavy stemmed points. Stratigraphic evidence to demonstrate their temporal relationship cannot be adduced for the Risston site, beyond the partly impressionistic observation that most surface sherds seem to be gravel tempered and the points small, whereas the heavier calcite-tempered sherds and large points predominate underground. It is tempting to conclude that the Risston terraces were once stratified like those at the Pottorff site; that wind action has carried away the soil of the later occupation, precipitating the sherds and other cultural debris on the present lowered erosional surface; and that the cultural deposit found in all our tests represents only the earliest occupation of the spot by pottery-making groups. This would be a credible sequence of events, more credible at least than the assumption that all the remains were left by one people. Nevertheless, it must be emphasized that the suggested sequence is inferential, and cannot be directly substantiated by any evidence now available to me from the Risston site.

Local collectors reported the presence of flints, stones, bone refuse, etc., along the creek banks for perhaps a mile upstream from the terraces just discussed—about as far up, that is, as tree clumps and waterholes may be found. Inspection by members of our party showed that these remains were thinly scattered, and revealed no concentrations that seemed to justify excavation.

The rocky bluffs that line the east side of the valley above the Pottorff site contain a few small scattered overhangs and niches, generally too small for habitation but of suitable size for burial or cache purposes. From one such overhang opposite the Risston ranch house, and roughly equidistant from the Pottorff and Risston sites, a burial is said to have been exhumed some years ago, but we were unable to secure any details concerning the find. Two members of our party sifted some of the dust from the floor of the shelter, recovering a number of small blue, white, and red glass beads. This indicates that, as might be expected, historic Indians had visited the overhang; but no evidence came to light that the prehistoric groups of the vicinity had used it or any of the other smaller cavities in the locality.

## SITE ON WALNUT CREEK, LANE COUNTY

### THE WALTER SITE (14LA2)

Walnut Creek, which joins the Arkansas River about 4 miles below Great Bend, rises nearly 100 miles to the west in the Tertiary uplands of Lane County. The greater part of its course is in the Plains Border region, and is characterized by a wide pleasant valley, often with picturesque bluffs, and with a good flow of water. The immediate banks are lined with hardwood forest, and in the old days, the bottoms were covered with prairie grasses. All this should have appealed strongly to the native peoples, hunters as well as farmers, and it is to be expected that numerous camp and village sites will ultimately come to light in the valley. At present, however, almost nothing is known of its prewhite inhabitants, other than the report of a site near the mouth and another—the subject of the present discussion—near its source.

The Walter site, half a mile south of Alamota in eastern Lane County, lies on a small well-concealed terrace on the left bank of the south fork of Walnut Creek. The creek, now dry at this point but said to have carried a good flow of water 15 or 20 years ago, skirts the north, west, and south sides of the terrace, with moderately high bluffs on its right bank. At the south edge of the terrace, 25 or 30 yards from the formerly inhabited area, are the remains of an old stone-walled spring. Of the timber lining the creek banks, cottonwood and hackberry are native, whereas walnut and ash are said to have been introduced by the early white settlers.[37]

The terrace includes less than 2 acres of ground, much of which is evidently too low and sandy to have invited occupancy by man. Most of the cultural deposits seem to have lain near the central and highest point, where an irregular area measuring about 20 by 35 yards had been completely dug over to a depth of 3 to 5 feet by the former owner, Mr. E. W. Walter. A considerable collection of broken pottery and stone implements was amassed in the course of this digging, and was placed in the excavator's private cabinet. Inspection of this material showed that at least two major pottery wares were represented, and that there were also significant variations in the projectile point types. These artifact differences, together with the unusual depth to which the remains occurred and the complete lack of any record as to specimen provenience, prompted our very brief follow-up work. Unfortunately for us, Mr. Walter's digging seems to have virtually exhausted the site; we can offer little more than a suggestion as to the cultural stratigraphy that appears to have once existed on the terrace.[38]

The Museum party's excavations consisted of an L-shaped cut into the northeast side of the Walter diggings, which resulted in a 25-foot north-south profile and a 10-foot east-west profile. The cut was 5 feet wide, except where the irregular edge of the earlier work narrowed its width, and the depth varied from 45 to 56 inches. The soil was removed in 6-inch strata. Several test pits and auger borings were put down in various parts of the terrace by way of further checking the depth and area of occupation.

In the uppermost 4 to 6 inches of topsoil were found several bits of iron (possibly modern farm refuse), an iron arrowpoint, and one small blue glass bead. Below this was a light-gray silty soil containing some sand and mixed with charcoal, bone refuse, flint chips, fragmentary stone implements, and thin cord-impressed sherds tempered with rounded gravel particles. There was some slight evidence of concentration of this material at about the 12- to 16-inch level, though it occurred elsewhere as well to a depth of about 22 inches. Below this was a much darker and more granular soil with fine calcareous veining and many fossil hackberry seeds; charcoal was more abundant than in the overlying stratum, as were also mussel shells and burned limestone fragments. Artifacts were not plentiful but there were a number of thick cord-impressed calcite-tempered sherds, stemmed and corner-notched points, end scrapers, miscellaneous retouched spalls, and other odds and ends. This zone, its dark color in striking contrast to the formations above and below, varied in thickness from 13 to 22 inches, and was underlain by a compact light yellow subsoil of loesslike texture and appearance. Auger tests indicated that this unmixed subsoil continued at least 5 feet deeper, becoming increasingly bright yellow in color.

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[37] Lieut. I. C. Woodruff's map of his 1852 reconnaissance of a military route from Fort Leavenworth to the Arkansas River (Nat. Arch., Cartographic Div., Record Group 77, Map U. S. 187) notes that Walnut Creek was "wooded from its mouth 75 miles"; and that below the forks there was "water running." The south fork bears the legend "Buffalo Cr, water in holes." The north and south forks of the Walnut unite a few miles south of present Ness City, presumably about the western limit of timber in Woodruff's day. The Walter site is some 20 miles by stream farther up the South Fork.

[38] The writer, though he inspected the site and the Walter collection, was not present during the excavation here described. The work was in charge of my assistant, M. F. Kivett, aided by J. M. Shippee and Charles Walter, son of the owner.

No fireplaces, cache pits, lodge sites, or other structures were noted in the main cut, nor is there any way of learning at this late date whether such features occurred in the area previously dug. One of the tests by Kivett's party, 7 yards east of the excavated area, disclosed an ash-filled fireplace 12 inches in diameter and 8 inches beneath the surface. An area about 30 inches across and 8 inches deep, centering at this ash bed, had been darkened and discolored by fires. Otherwise, none of the tests proved very productive, suggesting that so far as subsurface remains are concerned the area of occupation was small indeed. It seems rather improbable that further excavation on a larger scale would be warranted, unless perhaps in the section immediately east of our trench, and even here it is likely that only the fading margin of the older occupations still remains.

As might have been expected from a small random and apparently marginal excavation such as ours, relatively few artifacts were recovered. Nevertheless, if they be considered in relation to the soil stratum from which they came, certain stratigraphic differences seem indicated. Thus, all metal and glass objects came from the upper 9 inches. They included, in addition to items already mentioned above, a piece of flat strap iron 44 mm. long by 20 mm. wide, with one end cut square and the other deeply notched as though a triangular point 20 by 29 mm. had been cut out. This may represent scrap left over from the manufacture of an iron arrowpoint. Implements of stone included five or six fragments of end scrapers, a crude quartzite knife, a chalcedony flake knife, a thick chert core, and a fragment of sandstone muller or rubbing stone. Better made than any of these was a triangular brown chert knife measuring 73 by 43 mm., with the long edges oppositely beveled and the short side bifacially chipped. The only bone artifact was an awl 10.7 cm. long, made from split and dressed mammal bone, with a rounded butt and evenly tapered point. No pottery was found in the upper 12 inches.

From the 12- to 24-inch level, lying almost wholly above the dark buried stratum, came a broadly lanceolate curved brown jasper blade measuring 48 by 26 mm., with the edges retouched; an oblong cutting or scraping tool of weathered yellow chert 65 by 45 mm. in size; miscellaneous unworked or only slightly retouched flakes and spalls; the joint end of a small cut bird bone bearing several transverse scratches that may be flint knife (?) scars; and six cord-roughened potsherds. One of these, from above the 18-inch level, had a fine dense gray paste sparingly tempered with moderately fine (mostly under 0.25 mm. diameter) rounded particles of sand or gravel. The others, from below the 18-inch level, were thicker, with worn or weathered surfaces, and were heavily tempered with coarse angular fragments of crushed calcite.

Below the 24-inch level, in the dark buried stratum, stonework consisted mainly of spalls, chips, two projectile points and a few broken end scrapers. One of the points, of semitranslucent reddish chalcedony, measured 39 by 22 mm. with well-defined shoulders and an expanding flat-based stem; it came from a depth of 24 inches, apparently within the dark buried stratum. The second point, 26 inches deep, was of black basalt, with strongly marked barbs, a short broad stem, and dimensions of 35 by 35 mm. The sherds, 14 in number, occurred to a maximum depth of 38 inches; all but one were cord roughened, and inclusions consisted of crushed calcite or coarse (up to 3 mm. diameter) gravel, or both. These sherds ranged in thickness from 7 to 11 mm.

From the various smaller tests away from the old diggings came a crude drill, a unifacially retouched subquadrilateral knife or side scraper, a crude triangular point, spalls, animal bones, shell fragments, and two sherds—all from the upper 24 inches, and presumably above the dark stratum. Both sherds were thin (about 4 mm.), finely cord roughened with the impressions lightly rubbed over, and had a compact dark paste sparingly mixed with moderately fine rounded gravel. One was a rim fragment, with channeled interior and moderately collared exterior, the latter showing traces of two carelessly applied incised lines which once encircled the vessel just below the lip. These sherds conform to the single specimen found at the 18- to 24-inch level, and to a fourth very small fragment taken from the hearth at a depth of 8 inches underground. Significantly, these four specimens for which Upper Republican affinities are strongly suggested, lay above the dark stratum wherein were the thicker calcite-tempered sherds and stemmed projectile points that have equally strong Woodland implications.

No detailed studies were made of the Walter collection, but a series of 88 potsherds, said to have come from this site, was presented to the Museum by Mr. Walter's sons. Though these are unaccompanied by provenience records and so are of no stratigraphic value, it is interesting to note that two distinct wares occur, and that these parallel closely the two stratigraphically separate sherd types noted in our excavations. Thus, 29 of the sherds presented to us have a fine compact dark-gray to black paste, sparingly tempered with rounded gravel particles up to 1 mm. in diameter, and with a hardness between 4 and 6. In thickness, the sherds vary from 4 to 8 mm., but seldom exceed 5 or 6; surfaces are uneven and poorly smoothed interiorly, with cord impressions that may be crisscrossed and partly subdued by rubbing on the exterior. Rims vary from unthickened, vertical, recurved, or flaring forms to channeled and collar types bearing cord impressions or parallel incised horizontal lines immediately below the lip. In every respect, these sherds recall the Upper Republican pottery of southern Nebraska, and I think they can be attributed without hesitancy to that complex.

The remaining 59 sherds, though somewhat variable in appearance, are distinguished from the preceding series by their relative softness (under 4), their coarse granular paste, abundant inclusions of angular crushed calcite and/or moderately coarse to very coarse (up to 3 or 4 mm. diameter) rounded gravel, greater thickness (6 to 10 mm., usually over 7 mm.), and rather distinctive surface finish. The surface treatment, except for a few plain sherds, involves texturing by means of fabrics or fabric-wrapped implements. Characteristically (30 sherds), this texturing consists of boldly impressed parallel cord marks, usually coarser and deeper than those on Upper Republican pottery, and less often rubbed or polished over. One of these sherds, probably from just below the lip of the vessel, shows part of a circular boss punched inward from the exterior surface. A variant of this treatment, seen on seven sherds, differs only in the use of finer tightly twisted cords; one rimsherd shows faint horizontal cord impressions extending downward inside the rim to a distance of about 15 mm. below the lip. Another group of sherds, 8 in number, has been finished in different fashion. Low ridges or ribs run vertically down the vessel, at intervals of about 2 to 3 mm., between which are faint regularly spaced transverse ridges, such as might result from pressing a string of beads into the plastic clay. I am convinced that these imprints were not made with a twisted or knotted cord. The impression of tightly woven twined or of coiled basketry in plasticene most closely simulates the markings on these sherds. Unhappily, the sherds are rather small, and so the overall variations cannot be determined. Since the "ribs" run downward from the lip, the warp of the inferred basket was at right angles to the pot rim, as would be the case with a twined basket. On the other hand, it is possible that a large fragment or perhaps even a specially shaped coiled basketry form was used paddle fashion in texturing the surface. If further findings confirm this suggestion, the regularity and evenness of the "ribbed" or "beaded" surface would imply a rather high quality of craftsmanship in basket making.

Concerning the remainder of this group of sherds, little can be said since they have been badly weathered or otherwise defaced. Two or three bear imprints that may have been done with a cord-wrapped stick or dowel, and another shows a single broad incised line near a broken edge. Eight others conform in all respects save paste to the larger group; the paste is fine and dark, with few or no visible inclusions, and suggests that in the Upper Republican sherds described above. For the bulk of these heavy sherds, however, Woodland relationships are strongly indicated. There is, so far as our observations go, no good evidence of a crossing or mixing of the two pottery types, and the differences between them are generally clear cut and unmistakable.

From the surface of the terrace and from Mr. Walter's back dirt were collected a number of items that may be noted in passing. A light-gray sandstone slab 3 to 4 cm. thick had been fashioned into a rectangular metate measuring 26 by 30 cm.; the upper surface was smoothed, with the most pronounced wear in an elliptical area near the center, presumably by use of a muller in a circular or rotary fashion rather than with a to-and-fro motion. A 19-cm. section of weathered mammal rib was cut off square at one end, broken at the other; there were no other modifications from which its purpose might be guessed. Other specimens included a stemmed iron arrowpoint measuring 15 by 35 mm., three blue and white glass beads, scrapers of basalt and jasper, chipped knife and point fragments, a broken muller, and a fragment of another mealing slab. Other than the metal and glass, patently of Caucasian origin, none of these objects is sufficiently distinctive to be attributable to any specific cultural horizon. Their presence on this station does point up the fact, however, that much more than pottery is involved in the small stratified sites of western Kansas, and raises the hope that careful dissection of an undisturbed terrace deposit may some day give us a much clearer picture of the successive cultural complexes concerned.

In view of the meagerness and imprecise nature of the record from the Walter site, it is obvious that nothing definitive can be said regarding cultural associations.[39] That two distinct pottery wares were present seems clear, and from our limited excavations it would appear probable that one—the calcite-tempered ware—preceded the other. Probably associated with this older calcite-tempered pottery are medium to large stemmed or corner-notched projectile points, of which we unearthed two and of which the Walter collection includes several. Otherwise, there are only retouched spalls, a few scrapers, and one small piece of a rubbing or lapstone that can be certainly ascribed to this earliest period of occupation. From the thickness of the deposit a rather prolonged occupation, or more likely a series of intermittent (seasonal?) reoccupations, is probable, and the great abundance of broken animal bones strongly suggests a primary reliance on hunting.

The second, and inferentially more recent, ware seems to have been associated with more skillfully fashioned knives and scrapers. The Walter collection has a number of small triangular notched projectile points that may also have come from this horizon, but our work gave no direct proof of such an association. It would be interesting to know just where the mealing slabs occurred, and whether they were used for grinding corn or for pulverizing wild seeds, berries, or fruits.

A still more recent use of the terrace is indicated by the iron arrowpoints and glass beads. These, obviously, date from the last two or three centuries when the western Plains constituted the hunting territory of a score or more of tribes. Similar objects, to which no time or tribal label can be assigned, may be found on almost any suitable camping or watering place throughout the Plains area.

The cultural associations suggested above, and perhaps also the temporal distinctions, must be viewed with reserve; by themselves, the data from the Walter site are tantalizingly inadequate. Fortunately, there are other sites in the area that corroborate the above interpretations, and one of them at least—the Pottorff site—provides clear-cut evidence of sequence involving the same two prehistoric complexes implied at the Walter site.

## SITES ON LADDER CREEK, SCOTT COUNTY

During June and early July of 1939, 4 weeks were devoted to an examination of antiquities in and near Scott County State Park, 12 miles due north of Scott City (fig. 75). Scott County lies on the dry flat High Plains between Arkansas and Smoky Hill Rivers, 50 miles east of the Colorado State line. Along its northern edge is a strip of rough hilly ground where the upland margin is being dissected by ravines and short watercourses draining northward into the Smoky Hill River. Ladder (or Beaver?) Creek rises in eastern Colorado and flows in a shallow valley east by south to a point about 6 miles northwest of Scott City, whence it turns northward to empty into the Smoky Hill after another 12 or 15 miles. Though commonly represented on maps as an intermittent stream, live water is to be found along most of the lower 20 miles or more of its course, and there is or once was much excellent pasturage. An artificial lake has been created behind a concrete dam thrown across the creek half a mile south of the county line, and 1,200 acres of the adjacent valley are now set aside as a State park. Near its upper end, on the east side of the creek, is a 100-acre preserve containing a small herd of bison (pl. 65, *a*).

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[39] Very few faunal remains were recovered; they are insufficient to give reliable indication of possible stratigraphic variations. Species represented, with the number of bones or fragments ascribed to each, include: bison (14), prairie dog (4), jackrabbit (2), antelope (1), white-tailed deer (1), and skunk (1). The antelope and jackrabbit bones were found at depths of 24 inches or more, presumably in the Woodland-like horizon (cf. occurrence of these forms at Pottorff, p. 408); bison bones were distributed through all levels.

Ladder Creek, as stated, runs nearly due north through the park, in a pleasant little canyon varying from less than half a mile to nearly a mile wide. On either side are high irregular bluffs of Tertiary materials, overlying a Cretaceous chalk formation into which the immediate creek valley has been cut. At the contact between the porous Tertiary deposits and the underlying impervious chalk, ground water comes into the valley in considerable volume through a series of excellent springs. These are perennial, and their combined flow gives rise to the small but never-failing creek which meanders placidly down the valley between wide flat or gently sloping flood-free terraces. The banks are overhung with tall grass and bushes, relieved here and there by an occasional clump of cottonwood or willow. Buffalo and other short grasses dominate most of the uncultivated valley floor as well as the flat uplands beyond the bluff line. Ravines and short, deep box canyons, some of considerable size and ruggedness, open off the main valley, and bear straggling stands of timber interspersed with chokecherry, wild currant, buffaloberry, and similar small growth. In early days, the grassy valley and its broken margins gave food and shelter to a variety of animal forms, including bison, deer, antelope, wildcat, wolves, an occasional mountain lion or bear, and smaller species; and it can be inferred that prairie chicken, quail, and perhaps waterfowl were also available.

Today, the larger native mammals, and of course the Indians, are gone. The jackrabbit and coyote remain; there is a small prairie dog town near the south end of the park; and owls and turkey vultures nest in the crevices of the soft rocky ledges. The place, however, had not lost its charm altogether in 1939. The all but treeless valley, opening suddenly and unexpectedly at the feet of the traveler from the east, south, or west, with its yucca- and cactus-studded slopes, rocky bluffs, narrow steep-sided ridges, flat-topped buttes, isolated cones and mounds, immediately impressed one as a parcel of the Southwest; and its appeal was heightened by the sharp contrast between its green meadows and cool waters, on the one hand, and the dry sun-drenched seemingly endless surrounding plains. With its traditions of Pueblo Indians finding here a temporary escape from Spanish oppression on the Rio Grande, and of Dull Knife's embattled Cheyennes on their way northward to a nonexistent haven in the sandhills of Nebraska, the peaceful little canyon seemed like Indian country still.

### "EL CUARTELEJO" (14SC1)

Worked flints, occasional sherds, and other traces of aboriginal activity may be found at various points in, above, and below the present park area. The principal site—a ruined 7-room stone structure lying about midway between the north and south park boundaries—has long been known to archeologists through the researches in 1898 of S. W. Williston and H. T. Martin for the University of Kansas. It is situated on a slight knoll, about 75 yards west of the former creek channel and perhaps 250 or 300 yards from the west edge of the valley. The creek here follows a wide arc curving to the east, within which is a terrace some 500 yards long by 250 yards wide. There is a fine spring near the upper end of the terrace about 300 yards southwest of the ruin, from which may be traced the course of an old irrigation ditch that once watered the flat. An abandoned railroad grade, a scenic drive, and the impounded lake waters have partially obscured details of the terrain as it was in the days of Indian occupation.

Fortunately, there are extant several published accounts of the uncovering of the ruin (Williston, 1899; Williston and Martin, 1900; Martin, 1909). Briefly, it appears from these that walls 18 to 24 inches thick and about 2½ feet high, made of coarse-textured chalky boulders from the neighboring bluff, formed an east-west rectangle measuring 53 by 35 feet (fig. 78). This contained 3 rooms on the south and 4 on the north, no 2 of the same size (Martin, 1909, p. 14). There was no evidence of doors or other openings. Walls and floors were mud plastered. Fireplaces were rectangular, lined with thin stone slabs set on edge; one room contained two such hearths, and one that was unplastered also had no fireplace. Into the corner of one room had been built a small oven; another contained a typical pueblo grinding trough of clay, on a platform about 6 inches high. Most of the rooms had a pair of small postholes 12 to 18 inches apart, usually in one corner or near a wall, possibly indicating the position of ladders for entry and exit through a roof hatchway. Burnt

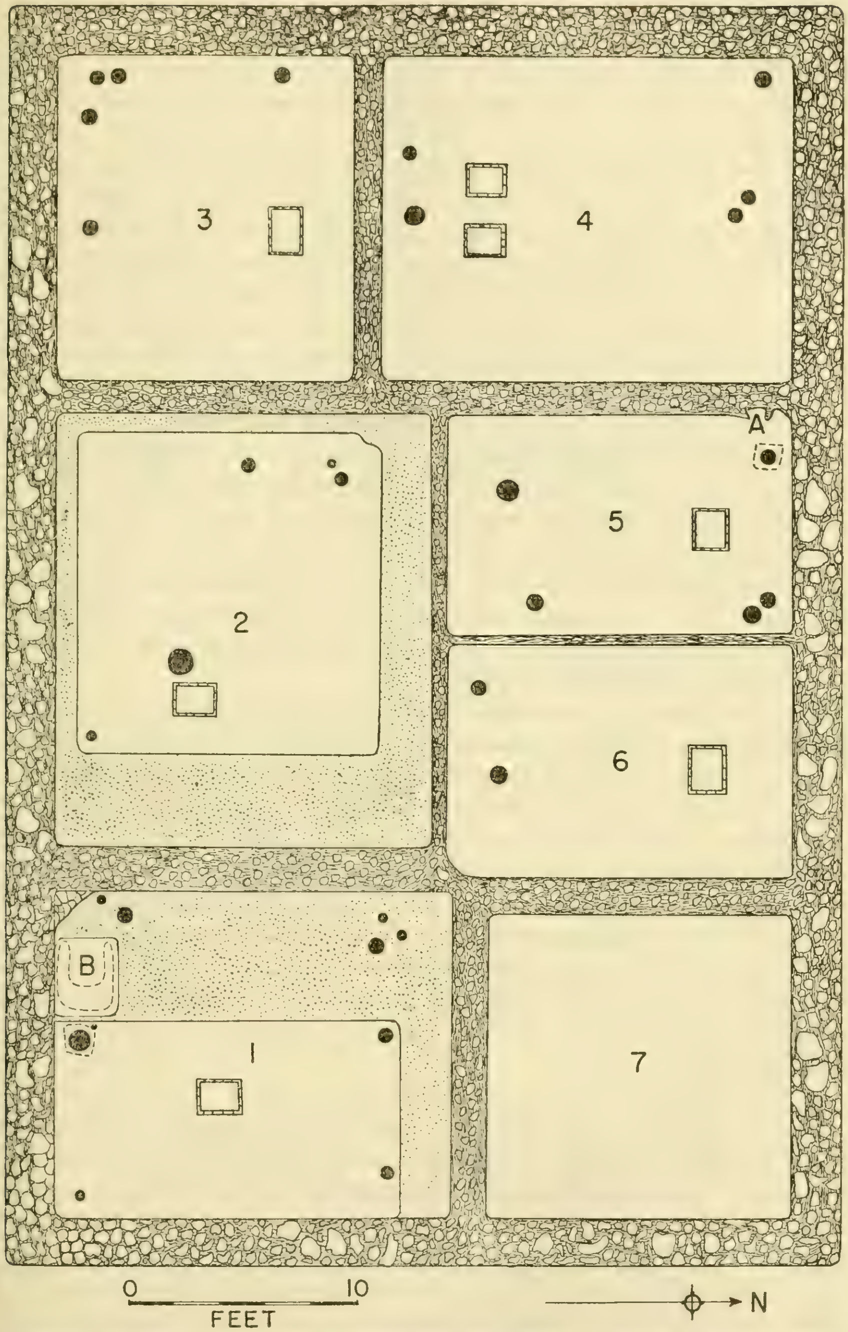

FIGURE 78.—Plan of Scott County pueblo ruin (after Martin, 1909). *A*, Oven in room 5; *B*, grinding basin in room 1; stippling, raised areas; solid circles, postholes; small rectangles, slab-lined fireplaces.

adobe, charcoal, masses of carbonized corn, and the scorched appearance of the artifacts all indicate destruction of the building by fire. By the side of the building were "two large hollowed out places, which had probably been used for the puddling and mixing of the adobe employed in the construction . . ." A hundred yards to the south was evidence of "several other smaller buildings, all of which must have been of adobe alone, since no rock remains"; these, too, seemed to have been burned out. About 25 yards to the north there were "three or four small structures, each separated a small distance in an east and west line parallel with the main building. These structures were apparently circular in outline, and were perhaps teepees." The investigators concluded that the ruin had been built by Taos and Picuries fugitives from the upper Rio Grande in the late 17th or early 18th century, and that it represented the "fortified" outpost thereafter known to the Spanish as El Cuartelejo. Concerning the latter point, we shall have more to say in another place; but there can be little quarrel with the estimated dating and none at all with the ascription of the ruin to a puebloan group. It is clear, too, that the occupants of the structure were in contact with, if not actually visited by, white men. A granite shaft at the southwest corner of the ruin now rises over the obscure traces of this, the northeasternmost known construction of the Pueblo Indians.

Our 1940 investigations were directed toward the finding of datable puebloan remains in association with a definable Plains culture horizon, in hopes of establishing thereby a time datum that could be extended eastward and northward to other recognized archeological complexes. We worked mainly in the previously untested refuse deposits and certain other nearby features not mentioned by Williston and Martin. Beyond relocating the corners of the stone-walled ruin as bases for our surveys, we did not examine the main structure. Efforts to locate and reexamine the lesser buildings reported north and south of it were unsuccessful and I suspect all traces of them were obliterated while the terrace was being farmed before it was set aside as park land.

### TEST NO. 1

Small exploratory pits were put down at a number of points on the main terrace, as well as on several nearby flats upstream and across the creek. In many of these, the topmost few inches yielded charcoal, flints, and other materials in meager quantity. About 70 yards due south of the monument, not far from the vanished outbuildings mentioned by Williston and Martin, the soil was mixed with bones, sherds, flints, and charcoal to a depth of 16 inches or more, well below any level ever reached here in plowing. A 50-foot north-south base line, divided into 5-foot units, was accordingly laid out, and systematic removal of all mixed soil begun (fig. 79).

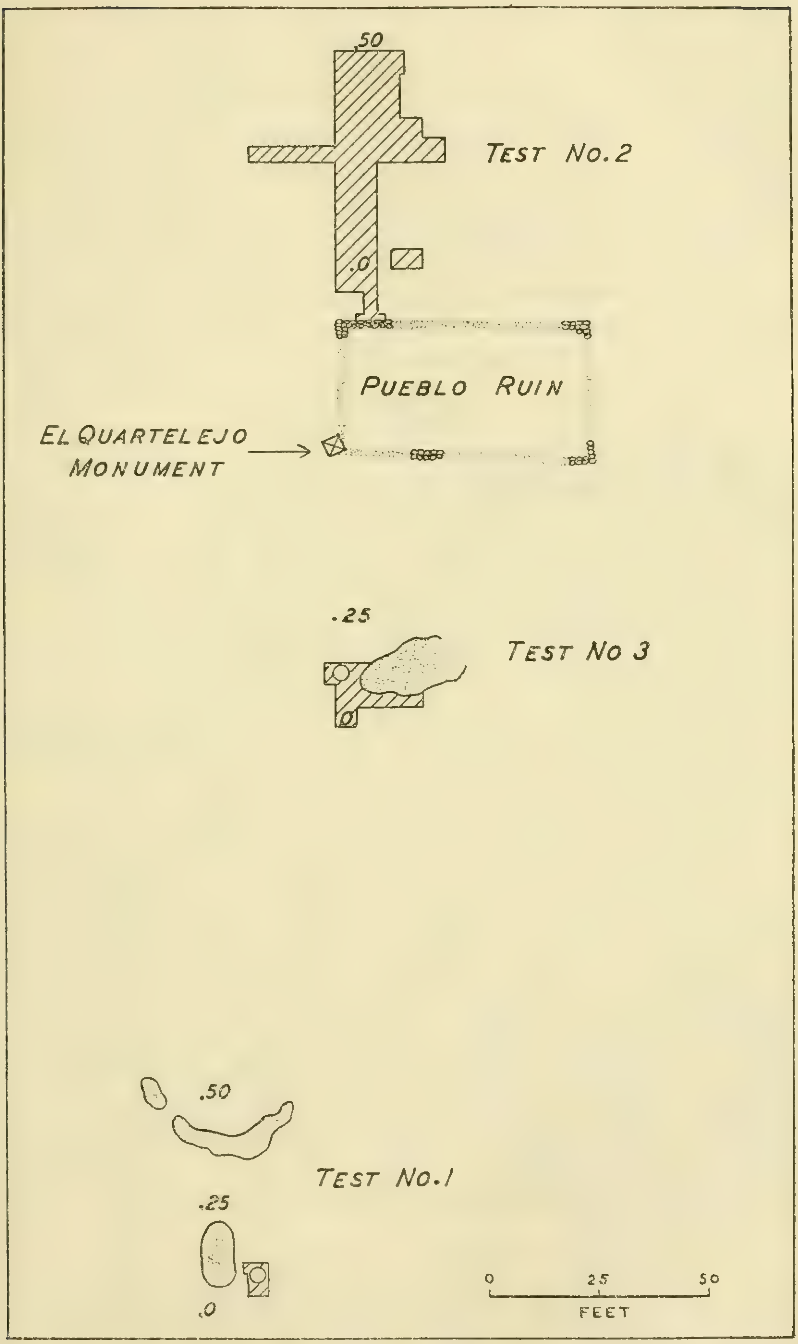
.50
TEST NO. 2
.0
PUEBLO RUIN
EL QUARTELEJO MONUMENT
.25
TEST NO 3
.0
.50
TEST NO. 1
.25
.0
0 25 50
FEET

FIGURE 79.—Map of excavations in vicinity of Scott County pueblo ruin and monument, 14SC1.

The first feature disclosed was an elliptical basin 8 feet wide by 16 feet long, with the long axis running north-south. At the center the floor lay 24 inches below ground surface, sloping evenly upward on all sides to a depth at the walls of 16 inches. The fill included much animal bone and charcoal, with lesser quantities of flint chips, potsherds, projectile points, scrapers, and the like. This material ended abruptly at the basin walls, which were easily traced on all sides. Five feet from the north end, midway between the east and west walls, was what appeared to be a posthole 7 inches in diameter by 12 inches deep. A similar but slightly smaller hole lay a few inches from the south end, also on the midline. There was no indication of a fireplace, unless a fire-blackened area 13 by 16 inches across near the northwest wall be so considered. The floor as a whole had not been hardened or blackened by fire, but the overlying mixed fill everywhere ended abruptly at this level and gave way to clean undisturbed subsoil except where the two postholes (?) reached greater depths. Among the artifacts may be noted the finding of an iron awl on the floor near the center of the basin. The purpose of the basin is not clear, but the postholes, if such they were, suggest that a structure may once have stood on the spot. The absence of a firepit argues against use as a domicile. It is possible, though I think rather unlikely, that the basin represents a borrow pit or that it was dug for the disposal of refuse. My guess is that some sort of temporary habitation or perhaps a summer shelter once stood here, the refuse having been thrown into the depression after abandonment of its original purpose (pl. 66, *a*).

Outside and near the south end of the basin, 3 feet from the east wall, was a circular bell-shaped pit 39 inches across the top, 53 inches across the bottom, and 39 inches deep. The walls and slightly dished floor were well defined, though not burned or lined, and the fill was comparatively soft and ashy, with some charcoal. Artifacts included sherds, scrapers, a ball of yellow ocherous clay, a tubular bone bead, two scapula hoes, a fragment of clay pipe bowl, a bone awl, three slender unidentified bone objects, a tubular bone bead, and a shell disk bead. In form, size, fill, and all other respects, the pit suggests a cache secondarily used for deposition of rubbish. It should be added that charred and rotted stick fragments lay over the top and about the mouth of the pit. These may represent remains of a cover, but they were within the zone of possible disturbance by the plow and could have been intrusive.

A few yards north of the basin and nearby cache pit was another area of refuse-filled soil. This was irregularly crescentic in outline, with an east-west extent of nearly 45 feet, but a width of only 3 to 8 feet (pl. 66, *b*). The fill was heavily mixed with ashes, charcoal, broken animal bones, stones, and other rubbish, so concentrated in some spots as to suggest the dumping of floor sweepings, fireplace ashes, and other materials from an all-out house cleaning. Depth of the fill varied from 14 to 20 inches. There was no evidence whatever of construction in connection with this deposit, and its irregularity of outline does not suggest a purposeful excavation to me. Two alternatives present themselves: one, that there was here originally a shallow swale or minor drainage channel that the Indians filled in with their refuse; the other, that earth had been dug from the strip by the Indians for some unknown purpose and the resulting depression subsequently utilized for a trash dump. Unfortunately, we obtained no evidence that would seem to balance the scale in favor of either of these possibilities, and the question remains undecided.

### TEST NO. 2

The principal midden area in the vicinity of the pueblo ruin apparently lies immediately north of the structure. There were no obvious surface indications in this spot, and the presence of subsurface deposits was disclosed only after a series of small exploratory pits had been opened. We dug a 60-foot test trench north from the base of the pueblo, crossing this with a 45-foot east-west trench about 35 feet from the wall. These cuts were subsequently widened in the most promising portions, so that a total area of nearly 900 square feet was worked out. The midden was by no means exhausted, but there is no way of judging what proportion of the deposit remains unworked (fig. 79).

The composition of the midden varied somewhat from point to point, but the profile along our north-south baseline seems to have been fairly representative (pl. 65, *b*). The pueblo wall itself, here represented by a single course of stones and covered by light-gray windblown soil, rested on clean grayish to brownish sandy soil containing small calcareous pebbles. From the wall northward the present ground surface rose a few inches for the first 5 or 6 feet, then gradually descended 14 to 18 inches in the next 40 feet, and finally rose slightly again. The uppermost 10 inches throughout most of this lateral extent consisted of fine gray material with some admixture of charcoal, animal bone, stones, and rubbish. Within this horizon, at a depth of 4 or 5 inches, traces of a cleavage surface were noted, the soil below being rather more compact than that above. The cleavage surface was accentuated by short thin lenses of fine sandy or silty material, nowhere exceeding one-half or three-fourths of an inch in thickness by 6 or 8 inches long. These occurred at intervals of 16 to 18 inches, or in what appeared to be approximate multiples of that interval. Here and there at the same level were thin seams of carbonized vegetal matter. I suspect that the cleavage plane represents plowsole, the charred material perhaps being burned grass or other surface growth turned under in farming. The regularly spaced silt lenses suggest wind- or water-laid material deposited on a surface of alternating ridges and furrows such as a cornfield might offer, the silted furrows having been finally covered over and leveled off by natural or mechanical agencies to give the present comparatively smooth surface.

From the wall to a distance of about 12 feet northward, this silt-lensed formation had been obscured by a disorderly bed of orange-brown burnt earth, charcoal, and other debris, with few or no artifacts. This bed, 3 to 8 inches thick, was traced west at least 10 feet and an equal or greater distance eastward from our cut; nearly everywhere, it seemed thickest near the wall, and contrasted strongly with the underlying deposits. I am inclined to think that this material was not originally deposited by the Indians as midden, but is part of the fill removed from the rooms of the burned-out pueblo during Martin's excavations.

Below the level reached by the plow, the soil contained an increasing proportion of cultural admixture, the greatest concentration everywhere occurring between 10 and 20 inches underground. This zone, of course, was somewhat variable in content and thickness, but generally yielded an abundance of broken animal bones, fire-blackened and often heat-fractured stones, bits of burnt earth, carbonaceous soil, flint chips, sherds, and a variety of complete and incomplete artifacts. With a few possible exceptions scattered at the north end of our diggings, there were no post molds,[40] though occasional shallow pits and burned hearthlike spots were noted. Below 20 or 22 inches, admixture thinned out rapidly; at no point, except where pits had been dug by the Indians, was cultural material found below 28 or 30 inches. The underlying sterile soil was generally brown or gray brown in color, sandy textured, with small rounded calcareous pebbles scattered through it. The undulating and somewhat pitted surface of this subsoil rose gradually toward the pueblo, more or less paralleling the rise of the present ground line. Five feet from the pueblo wall, it curved sharply upward, so that the refuse strata pinched out in the windblown gray dust piled to a depth of about a foot against and over the stone foundation. Thus, stripping of the midden to unmixed subsoil would leave the pueblo wall foundations standing on a slight knoll of similarly unmixed material 1 to 2 feet high.

The special features encountered during the midden excavations may be briefly noted; all seem to have rested on, or been dug from, approximately the 20-inch level. Beginning 15 feet from the wall, and running almost continuously northward for about 12 feet, was a 1½-inch layer of very dark carbonaceous earth, containing corn, cobs, squash rind, bones, stone, and other refuse. At the same level, nearer the pueblo, the soil was lighter in color, but likewise contained much trash, including a scrap of iron and one or two glass beads. Beneath the north end of the black charred layer, whose east-west spread was not worked out but certainly exceeded 5 feet, a shallow basin 24 inches across had been scooped 10 inches into the subsoil and filled with bones and stones. Ten feet north, and at the same level, was a second charred area approximately 10 feet long by 5 feet wide. At its east edge was a shallow circular basin 30 inches across by 6 or 7 inches deep, filled with irregular lumps of orange-brown and black burnt clay, charred sticks, and ashes. The walls of this basin were baked hard to a thickness of 1 or 2 inches; in and about it, besides the materials just noted, were found carbonized corn, cobs, and bits of squash or gourd. The surface about the firepit, on which the burned materials were scattered, seemed rather well compacted, though there was no evidence of a covered structure or definite habitational unit.

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[40] Two or three probable post molds were partly filled with broken longbones of bison inserted upright, as if to wedge a post or standard.

Near the north end of the trench, and evidently dug originally from the 20-inch level, was an elliptical refuse-filled basin measuring 10 feet by 7 feet 3 inches. Its long axis lay slightly east of north and west of south, and the bottom was 35 inches below present ground surface. The sides of the basin curved evenly upward in all directions from the deepest point; they were covered by a 3- to 5-inch layer of bone, charcoal, and other debris, in turn overlain by 2 to 3 inches of ashes. Removal of this burnt fill disclosed the bottoms of two older pits, each approximately circular in plan with one partly overlapping the other. Both appear to have averaged 42 to 48 inches in diameter. Pit 1A, undoubtedly the earlier, reached a total depth of nearly 50 inches below the present ground level, or 30 inches below the plane into which the basin had been sunk; pit 1B was about 7 inches shallower. Both contained numerous animal bones, stones, sherds, and carbonized material. Their original depth can only be guessed at; if the 20-inch level from which the overlying basin was excavated represents the surface at time of habitation, the two earlier pits would have been about 30 (pit 1A) and 23 (pit 1B) inches deep. It is possible that the basin itself was not purposefully dug as such, but instead resulted from collapse of the upper part of the pit walls, though this view is admittedly debatable. At the northeast edge of the basin, and also at the 20-inch level, was a flat-bottomed depression measuring 35 by 24 inches across and 3 inches deep. Filled with very dark burnt soil, charcoal, and ashes, this probably represents a fireplace, but its exact relation to the adjacent refuse basin and the two earlier (cache?) pits is not clear.

The burned areas, hearth complexes, and other concentrations of refuse at or very near the 18- to 20-inch level throughout test No. 2 presumably mean that this and the immediately overlying fill represent the period of most intensive occupancy of the site. They appear to have been outdoor cooking areas, perhaps used by the inhabitants of the pueblo during the warm summer months. There is no evidence that they antedate construction of the pueblo; on the contrary, they seem to have been placed in a slightly depressed area that was gradually filled and its surface raised by prolonged accumulation of refuse. A considerable proportion of the overlying fill is soil and sand, probably of aeolian origin, but this material is intermixed everywhere with household rubbish, and there is no indication of periods of abandonment. The 20 inches or more of refuse-mixed soil certainly indicates an occupation of some duration, but there is no way of judging its length in terms of years. The deposit is evidently wholly, or almost wholly, post-Caucasian, since iron and glass beads occurred very sparingly but inclusively to within a few inches above undisturbed subsoil.

Curiously enough, material distinctively puebloan in origin was exceedingly scarce; other than an occasional incised clay-pipe fragment, there is almost nothing in our collections that would not be expectable in an already defined nonpuebloan Plains culture horizon. Yet, in nearly all respects, the artifacts we recovered from the midden closely parallel those found by Williston and Martin (Martin, 1909) in the ruin, and there is scant doubt in my mind that the midden in test No. 2 is to be attributed to the inhabitants of the nearby pueblo. We shall return to this problem elsewhere after the artifacts have been fully described.

### TEST NO. 3

Twenty yards due south of the "El Cuartelejo" monument a third midden area was partially worked out. As with those described above, surface indications were virtually nonexistent, though the refuse occurred in a rather well-defined, possibly dug, vertical-walled basin somewhat like that in test No. 1. The area involved was irregularly elliptical in outline, with the long axis running roughly east-west. The maximum width was 12 feet, and the length of the area we opened was about 25 feet; test holes indicate that refuse-mixed earth continued for some little distance eastward beyond the limit of our digging (fig. 79; pl. 66, *c*).

The uppermost 10 inches of basin fill included much fine silty material and on exposure dried rapidly to an extraordinary hardness; artifacts and refuse were comparatively scarce, suggesting that most of this zone had been blown, washed, or otherwise deposited since the time of the Indians. Below the 10-inch level, the fill was very much softer and contained much ash; in places, this could be removed by the unaided hand alone. Between 12 and 18 inches depth over most of the basin were heavy concentrations of ash mixed with charcoal, these tending to form lenses up to 6 inches thick. Here and there, in this same stratum, were seams of burnt grass, bits of corncobs and stalks, and other fragmentary vegetal material. Near the south wall, at a depth of 17 inches, lay six bison vertebrae which had evidently been deposited in articulation. Scattered through the underlying fill, and most plentiful in the 4 or 5 inches immediately above the basin floor, were sherds, worked flints and chips, bone tools, animal bones, and stones. The floor itself, at a depth of 26 or 27 inches, was covered with a layer of fine black silt, apparently washed in or perhaps deposited in ponded rain waters; above this, in turn, was a thin stratum of carbonized material. Except at the east end, the walls of the basin everywhere were of light, unmixed, sandy soil markedly unlike the fill and in consequence easily definable.

Careful scrutiny of the cleared floor revealed no evidence of post molds, but near the center was a very slightly depressed subcircular area 42 by 36 inches in diameter containing much burned earth and vegetal matter. A hearth is suggested, or possibly the floor of an earlier, i. e., prebasin, cache or cooking pit.

Just outside the refuse basin, a foot from its west end, stripping away of the 6 or 8 inches of plow-disturbed topsoil disclosed a nearly circular dark mottled area just under 4 feet in diameter and contrasting strongly with the surrounding light-gray soil. This proved to be a well-defined pit (pl. 66, *c*), whose walls curved outward slightly at a depth of about 7 inches and then converged gradually to a faintly concave floor 42 by 38 inches across. Maximum depth from present ground surface to floor was 34 inches. In all these dimensions and in its general form, the pit fell within the range of variation noted for prehistoric caches of the Central Plains. The fill, however, suggested neither primary storage nor secondary utilization for dumping of household rubbish. Below the plow-disturbed topsoil there was first a 6-inch deposit of dark soil mixed with charcoal, and under this a layer of irregular burnt limestone fragments. Then came an 8-inch stratum of fire-reddened earth, underlain by a 10-inch thick bed of charred sticks and twigs. On the pit floor were scattered a few more stones intermixed with charcoal and ashes. The walls at a depth of 22 inches, corresponding approximately to the burned earth stratum within, had been baked hard and discolored to a thickness of 2 to 4 inches. All this unquestionably means that very hot or prolonged fires had been maintained in the pit; and, in the light of certain other finds to be described shortly, it seems reasonable to infer that this and similar pits (fig. 80) were dug for a

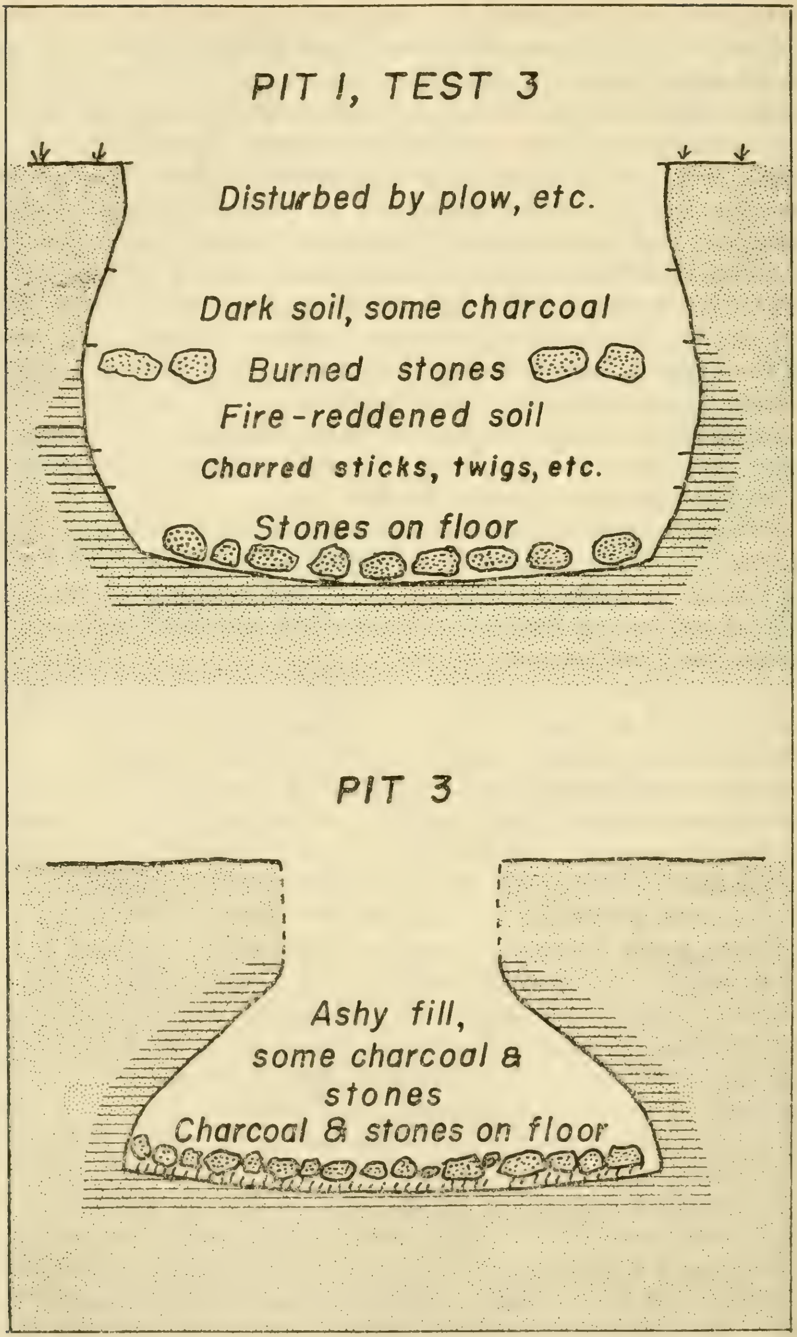
PIT 1, TEST 3
Disturbed by plow, etc.
Dark soil, some charcoal
Burned stones
Fire-reddened soil
Charred sticks, twigs, etc.
Stones on floor
PIT 3
Ashy fill,
some charcoal &
stones
Charcoal & stones on floor

Figure 80.—Cross sections of two roasting or baking pits, Scott County site, 14SC1. Horizontal shading indicates fire-hardened walls and floors.

specific purpose other than food storage and do not represent burned-out caches. Artifacts, we may add, were absent except for a few small sherds and scraps of animal bone.

### ROASTING PIT (PIT 3)

On the park ballground, 110 yards north-northwest of the monument, a small area of soil discoloration was noted on the ground surface by a member of our party. The topsoil was carefully stripped away to a depth of 9 inches and to a distance of 2 or 3 feet in all directions. At this level the discoloration showed up as burned earth and carbonized material surrounded by a well-defined ring of orange-yellow fire-hardened soil averaging 2 inches in width and 19 inches in inside diameter. Outside the ring was dark-gray unmixed loam. A vertical section bisecting the ring showed that it was the strongly constricted neck of a jug-shaped pit, the walls of which flared outward and downward to a maximum diameter of 44 inches, retaining to the bottom their orange-yellow color and bricklike hardness. The fire-blackened floor was 28 inches underground at the center, rising slightly to 25 inches depth at the perimeter. A thin bed of charcoal and ashes covered the floor, and on this was an almost continuous layer of irregular, heavily burned limestone fragments from 2 or 3 to 8 or 10 inches in maximum diameter. Above the stones, the fill was light and ashy, and contained a heavy admixture of burned sticks, twigs, and other organic matter. A single flint scraper was the only artifact found in the fill (fig. 80, *bottom*, and pl. 67).

The virtual absence of artifacts in the pit, together with the heavily burned walls, blackened floor, high ash and charcoal content, and calcined rocks, all argue against its use for the concealment of foodstuffs or other household possessions. Prolonged and intensely hot fires are certainly indicated, and these can hardly have been other than intentional. I think there can be little doubt that the structure represents a roasting oven used in the processing of certain food materials. Noteworthy in this connection was the absence of any evidence whatever of a draft hole.

### OTHER EXCAVATIONS

Numerous small exploratory pits were sunk by members of our party at a number of habitable spots upstream and downstream from the terrace on which the principal ruin lies. Most of these disclosed traces of charcoal, flint chips, and other materials in the topsoil, but usually not in sufficient profusion to invite extended excavation. The most promising were on a terrace east of the creek, 4 to 5 hundred yards east of Big Spring, immediately west of the "Buffalo Park," and about 1,000 yards due south of the monument. The abandoned railroad grade which traverses the entire north-south extent of the park, crosses the south part of this terrace in a cut.

As elsewhere in the park, surface indications of aboriginal activity were exceedingly scanty. Near the south-central part of the terrace, however, between the railroad grade and the creek, there was a pit which had been partially dug out not long before our arrival. Moreover many years ago another pit closely resembling the roasting oven opened by us on the ball ground, had been excavated by Mr. A. T. Hill of the Nebraska Historical Society in the west face of the railroad cut. All this raised hopes on our part that careful search might disclose the presence of habitational units, puebloan or otherwise—hopes which, however, were not fulfilled.

The newly opened pit mentioned above had been dug to a depth of about 2 feet and at no point had either the floor or the wall been reached. We completed its excavation, delineating a circular cavity 48 inches across the mouth, 60 inches across the bottom, and 41 inches deep. The walls had been burned to a bright red color, in places as much as 3 inches thick. The bottom was flat; on and immediately above it were a number of burned limestone fragments, broken mussel shells, and numerous large bones of bison. A 5-inch layer of charred sticks and twigs extended entirely across the pit, 3 feet below the ground surface. The exact character of the fill above the ash could not be ascertained, but it seems to have contained many animal bones as well as charcoal and ash. Near the top, to judge from the narrow ring of fill left for our observation, there were some thin laminae of silt, perhaps deposited in standing waters before the cavity had been entirely filled in. This pit, I believe, represents another roasting oven, used as a receptacle for refuse after its abandonment for cooking.

Thirty-five feet north of this oven was found a shallow elliptical basin measuring 54 by 30 inches, and 14 inches deep. From this were taken broken bones, flint chips, charcoal, and burnt earth. At the north side of the basin was a cluster of limestone rocks 14 inches in diameter and 8 inches below the present ground surface. A single smooth grit-tempered sherd came from the rock cluster.

West of the drive which crosses the terrace, and about 30 yards southwest of the oven, was another cluster of burned stones. These lay 12 inches underground; the overlying fill was somewhat darker in color than the surrounding soil, and contained a few scraps of bone and a quartzite knife. The stones covered an area 24 by 39 inches, slightly depressed at the center; mixed soil extended but a few inches beyond in all directions, including an area 35 by 45 inches.

About 30 yards northeast of the oven burnt earth and charcoal were detected at a depth of 6 inches. At 7½ inches this mixture graded into a mass of charred twigs filling a basin 22 inches in diameter and

5 inches deep. The basin walls were burned a rusty brown color to a thickness of about an inch. Two stones lay in the basin, near the south wall. Trenches run out from the charcoal basin disclosed not the slightest indication of a habitation unit, though burrowing rodents had transported bits of charcoal 5 and 6 feet in all directions and to depths of 2 and 3 feet at several places (pl. 66, *d*).

The pit investigated by Mr. Hill[41] lay at the edge of the terrace; one side had been removed by the railroad cut, so that a full cross section of the structure was exposed. In shape and dimensions it closely resembled the roasting pit opened by us on the ball ground, with a circular floor, walls incurving at the top, and a narrow mouth. The floor diameter was 42 inches, the depth 23 inches, and top diameter less than 22 inches. The walls were fire reddened to a thickness of several inches; and large chunks of this baked earth, evidently broken or caved off from the pit mouth, were found in the fill below. Hill suggests that the original opening was perhaps nearer 15 or 18 inches across. To one side of the opening, lying just beneath the sod line, was a large stone slab which may have been used as a covering for the pit. Leading out toward the terrace front from one side of the pit, at floor level, were traces of what Hill believes was a draft hole 8 or 10 inches in diameter. In this particular, the pit seems to be unique among those opened from time to time in this locality. Several inches of fine wood ash and some charcoal covered the floor; no artifacts are mentioned.

Despite our inability to locate definable lodge sites, there can be no question as to the utilization of this terrace by Indians. In all probability the stone- and/or charcoal-filled basins represent fireplaces, used from the present ground surface or from a dust-covered level only a few inches lower. The pits dug by us and by Hill can hardly have been other than roasting ovens, similar to those near the pueblo ruin. Few artifacts were found; they were mostly of stone and not particularly diagnostic. Recognizable puebloan objects were not present. I see no reason for attributing the remains we found on this terrace to Indians culturally other than those who left the refuse deposits and other traces about the pueblo ruin, or to earlier or later peoples.

### IRRIGATION DITCHES

Brief mention has already been made above of the obscure traces of an old irrigation ditch that once led spring waters onto the terrace occupied by the pueblo. The springs lie a few yards north of the old Steele home, residence of the owner of the property at the time of Martin's excavations, and just below the edge of the present roadway.

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[41] Letter of July 26, 1945, and photographs KSc 1–7, 13, and 16 of the Nebraska State Historical Society's archeology files.

A short stretch of the canal, perhaps 2 feet deep by 4 or 5 feet wide, is still used to water a vegetable and flower garden immediately to the south. Most of its former course, however, has been more or less completely filled in, and is further obscured by the old railroad grade and the present scenic drive. It is faintly discernible just east of the railroad embankment as it curves around a shoulder of the hill to run northward. Its northern terminus we were not able to ascertain, nor do Williston and Martin give any clue to the original length. Presumably, it could have supplied water for several acres of corn in the immediate vicinity of the pueblo.

About half a mile to the south there is a second group of springs known today as Big Springs. From these we were able to trace a ditch, perhaps 5 feet wide by 4 to 6 inches deep, that ran northward around the head of a short draw and then northeastward onto a flat just south of the park superintendent's residence. The draw has apparently been widened or lengthened slightly since the ditch was in use, as there is a break at this point. The end of the trace appears to be some 250 or 300 yards from the spring. This is apparently the ditch alluded to by Williston (Williston and Martin, 1900, p. 125) as follows:

> About a half mile above the site of the present ruins, the tertiary underflow comes to the surface along the side of a hill in such perpetual abundance that it is utilized in the irrigation of a considerable tract of land.

We made no attempt to cross-section either of these two canals during the 1940 work, and therefore can throw no new light on their structure or possible antiquity. Local informants assured us that the following statement by Martin (Williston and Martin, 1900, p. 130) applies to both:

> Mr. H. H. Hathaway informs me that the earliest settlers here utilized what were undoubtedly the remains of an old irrigating ditch in digging their own ditches in the vicinity of the present residence of Mr. Steele, and which ditches he now uses in the irrigation of his garden.

### LATER INVESTIGATIONS

During the winter of 1944–45, purposeful lowering of the lake level laid bare considerable areas of terrace that had been inaccessible to us in 1939. Mr. Hill made several visits to the spot at this time, and informed me [42] that some distance north of the "El Cuartelejo" monument in the vicinity of the present bath house there is "evidence of a very large camp ground, and several fireplaces show." Pottery and other surface remains appear to be identical with those excavated by us about the pueblo ruin. A notable exception is a painted sherd retrieved from the mud near a cache pit, and since identified by Mera [43] as Tewa Polychrome. Nearby, a "burned out cache" was opened; it was 14 inches across the top, 36 inches deep, and 36 inches across the bottom. The walls from mouth to floor had been burned red to a depth of 3 inches or more, and, as with the roasting pits described above, they met the floor in a curve rather than at an angle. Much ash and charcoal, but apparently no artifacts, were present. I have no doubt from the description given by Hill that this is another roasting pit, and that the remains here can be safely ascribed to the same people as those who dwelt about the pueblo. It is to be regretted that circumstances apparently precluded a thorough-going survey and excavation of the site or sites temporarily exposed by the lowered lake waters.

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[42] Letter of July 23, 1945.

[43] Letter to Wedel, August 9, 1945.

### FOOD REMAINS

*Vegetal materials.*—Charred cob fragments and kernels of corn were found in tests 2 and 3, but nowhere in any quantity. Cob fragments are 12 to 18 mm. in diameter; most seem to have been 8-rowed, with a lesser number of 10-rowed pieces. Several include short sections of the ear stalk or bits of husk about the base of the cob. From the roasting pit on the ball ground, associated with husk fragments and with 13 mm. of the stalk still attached, came a small 8-rowed nubbin about 30 mm. long, with the husk still covering 2 or 3 rows of kernels. Another cob from the same pit is 65 by 17 mm. in size and had 8, or less probably 10, rows of kernels. The kernels generally seem short and fat, measuring about 7.5 mm. long, 8 mm. wide, and 5 mm. thick.

In contrast to the scarcity of corn in the middens we tested, is the great amount reported in the pueblo ruin (Martin, 1909, p. 15). Of this, Williston (1899, p. 111) previously observed that—

> The most interesting fact, however, connected with the ruins is that the corn is not the modern white man's corn, but the primitive aboriginal corn. Fragments of the cobs, as I found them, were not larger than one's finger, and had only a few rows of kernels upon them. The kernels were larger than those of popcorn, smaller than our field corn, with rounded surfaces, each individual kernel but little compressed by its mates. This corn is so very distinctly different from any now grown in the state, that it at once proves the antiquity of the structure. The corn, if not grown by the aborigines, must have come from seed furnished by them. This corn is found in considerable abundance, quarts or even pecks of it may be obtained with a little labor. . . . This corn has also been reported from other places in the vicinity. . . . The corn evidently formed the staple food-product of the inhabitants, and I have no doubt whatever but that it had been grown in the immediate vicinity.

I have the impression that samples of this charred corn are preserved in the Museum of Natural History at the University of Kansas. Since it appears to differ in size of cob, row number, and perhaps in other particulars, from the older corn recovered by us in the Rice County sites, an examination by maize experts and plant geographers may be in order. It would be interesting to know particularly whether its closest relationships are with southwestern varieties or with those developed by the semihorticultural Indians of the eastern Plains.

Fragments apparently of squash or gourd rind were found in the hearth in test 2; and Martin (1909, p. 18) mentions finding of squash seeds in one of the rooms in the pueblo. We found no beans or sunflower seeds.

A single fragmentary pit of wild plum was taken from our test 2.

*Turtle remains.*—Of these, at least three, and possibly four, forms were represented. Most common were bones of the cooter or pond terrapin (*Pseudemys*). Leg bones and miscellaneous fragments of the common snapper (*Chelydra serpentina*) were present, some of them from rather large individuals. There were a few carapace fragments of the box turtle or land terrapin (*Terrapene*). Less certain is the identification of several bones of the painted turtle (*Chrysemys*). None of the turtle bones or carapace frgaments bore any tool marks or other evidence of modification for the making of artifacts. As a food item, turtles cannot have been very important, if used at all, because their remains comprise but a very small part of the bone refuse.

*Bird bones.*—These, too, were scarce, there being not more than 12 identifiable specimens in our series. They include the following forms, of which the first three were presumably taken for their feathers; the others for their flesh and/or feathers:

Ferruginous rough-legged hawk (*Buteo regalis*)
Prairie falcon (*Falco mexicanus*)
Great horned owl (*Bubo virginianus*)
Coot (*Fulica americana*)
Teal (*Anas* sp.)
Anatidae (Duck)
Whooping crane (*Grus americana*)

*Mammalian remains.*—For the most part, the animal bones encountered were broken up and splintered so badly that their identification was impossible. A few were weathered as if they had lain on the surface for a long time before being covered, but the majority had a smoother fresher appearance. Fire blackening was noted in a few instances, and etching by rootlets or soil acids was quite common. None of the bones showed tool marks.

Identifiable bones represent the following forms: bison (*Bison*), 51; deer (*Odocoileus*), 32; dog (*Canis*), 17; prairie dog (*Cynomys*), 2; badger (*Taxidea taxus*), 2; and pocket gopher (*Geomys*), 1. Bison bones, as might be expected, were most abundant, and this species, together with deer, evidently furnished the great bulk of the meat consumed by the natives. The endless grasslands surrounding the valley, and even more, the permanent springs and lush grass of the valley itself, probably brought the herds within easy reach of the village; and local traditions speak of some of the side canyons as former bison traps, for which purpose they would have served admirably. Deer may have inhabited the brushy side canyons, as well as the Smoky Hill valley not far to the north. The absence of antelope remains seems strange, since the terrain looks like good antelope range; but perhaps deer were easier to get, more palatable, and their horns and hides of greater usefulness to the Indians.

The dog remains were all those of small to medium-sized animals, no larger than a coyote; there was no evidence of the large, powerful draft-type beasts indicated at the Rice County sites.

The last three forms may or may not belong to the native food list; all are common Plains species and the broad grassy flat on which the site lies is just such a location as would attract rodents and burrowing animals. There is still a sizable prairie-dog town a mile or two up the valley, though no burrows were observed on the village flat. In any case, these small forms evidently did not figure very heavily in the native economy.

### POTTERY

Our collections from the site include 3,810 sherds, of which 3,382 are body fragments and 428 are rim pieces; there are no whole or restorable vessels, other than 1 or 2 miniature pots. Almost without exception, the sherds are small, and rarely is it possible to even guess at the vessel forms or sizes originally present. With the exception of four shell-tempered sherds of foreign origin, all of the material is probably of local manufacture. Two wares are indicated.

The majority ware, for which the name Scott Plain is suggested, is represented by 3,208 body sherds and 414 rimsherds, or 95 percent of the total. It is dark in color, and contains rounded quartz inclusions ranging in diameter from 0.25 to 3.0 mm. and averaging between 0.5 and 1.0 mm.; the inclusions are usually moderately abundant, but are smaller than those in Upper Republican ware. Paste is fine and even in texture, with a straight granular fracture and some tendency to crumble on a freshly broken surface. Surface hardness varies from 3 to 4.5, and occasionally reaches 5. Color, usually very dark gray or nearly black, is sometimes light buff or reddish brown. Occasional pieces show a light-colored core, with one or both surfaces dark to a depth of 0.5 to 1.0 mm. The darkest pieces often have a carbonaceous crust on the exterior surface, and when crushed have a sooty or "greasy" look and "feel." Surfaces are generally uneven, occasionally imperfectly smoothed, but never polished, slipped, or painted. On some pieces the aplastic protrudes on the interior to give a rough, gritty surface, but this is not characteristic.

Vessel shapes are uncertain,[44] but there are pieces suggestive of jars with recurved or flaring rims, constricted necks, and rounded shoulders, and none indicative of bowls, bottles, or other forms. Fragments of a low conoidal base from a squatty jar were found in test 2. Rimsherds are nearly always simple, direct and unthickened, with an uneven rounded or sharpish (never flattened) lip, and they seem generally to have been outcurved or flaring with reference to the constricted neck. Sherd thickness may be as much as 11 mm., but the vast majority are less than 6 mm. thick.

Decorative treatments of any sort, as well as appendages, are almost absent. Thirty-one sherds, less than 1 percent of the series under consideration, bear simple stamping made with a grooved paddle. This includes several rimsherds in which the stamping extends up to the lip. Two rimsherds, out of a series of 414, have diagonal incisions on the lip, and one of these has in addition a small lug on the outer upper edge of the rim flush with the lip. Two body sherds each have two or three parallel incised lines that may once have formed part of a larger pattern.

The minority ware includes 171 body and 13 rim sherds, just under 5 percent of the total. These are distinguished from the preceding by their thinness (about 3 to 4 mm.), by the great abundance of minute particles of mica, by their hardness (approaching 6), and by their high-pitched metallic ringing when dropped on a sheet metal surface. Microscopic examination of crushed fragments shows a high mica content throughout, with a few siliceous particles that seem rather more angular than the quartz inclusions in the majority ware. E. P. Henderson, of the Division of Mineralogy, United States National Museum, to whom representative sherds of both wares were submitted, observes that the minority sherds differ very markedly from the others, having been intensely burned, often to the point of sintering. The paste is black, fine, sooty, and friable. Sherd surfaces are uneven and often somewhat granular, but are smooth to the touch. Most show the presence of mica on one or both surfaces. One sherd has a suggestion of simple stamping; four or five show striations at first thought to be from grass-brushing but in one case a plasticene cast looks like fine tightly twisted cord impressions. Otherwise, the sherds are plain, and the rims, except for their thinness, do not differ from those of the majority ware. There are no appendages and the vessel shapes are unknown. I am not certain whether this ware can be called mica tempered; it may be that the mica and quartz particles were derived from some weathered granitic rock and thus were part of the clay used rather than an added aplastic. In any case, the name Scott Micaceous seems appropriate as a designation for the ware.

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[44] This statement requires some modification. When A. T. Hill in the winter of 1944–45 examined caches exposed by lowering of the water in Lake McBride (p. 438), he recovered numerous sherds, including parts of at least two large jars. One of these, restored, is shown in plate 68, *b*. It measures approximately 36 cm. in height; diameter is irregular, varying between 30 and 35 cm. The lip is undecorated. The piece can probably be classed as Scott Plain, although it is considerably larger than the majority of these vessels presumably were. Except for its greater size, this plainware jar seems to conform to the largest vessel figured by Hill and Metcalf (1942, p. 181 and pl. 6, fig. 2) from 25CH1, a Dismal River culture site in Chase County, Nebr.

Restoration of the second piece has not been possible, but it appears to have been a jar with somewhat subconoidal body terminating in a small flat disk base about 6 cm. in diameter. The paste and finish seem alien to the local complex, suggesting a trade piece from the Great Bend Aspect—or perhaps a local product made in direct imitation of Great Bend pottery.

Two miniature vessels are represented in our collections. The larger, represented by about one-fourth of the original pot, seems to have had a globular or slightly ovate body, constricted neck, and low slightly flaring rim. Its height was probably not over 70 mm., with a diameter slightly smaller and a wall thickness of 3 to 8 mm. It is gravel tempered, contains some mica, and there is a suggestion of simple stamping on the lower body area (pl. 68, *a*).

The second piece has a sharpish lip, somewhat constricted sides, a broadly pointed base, and a more or less conical cavity. The paste is buff colored, and contains no visible aplastic. Maximum diameter is 36 mm., height about 30 mm. (fig. 81).

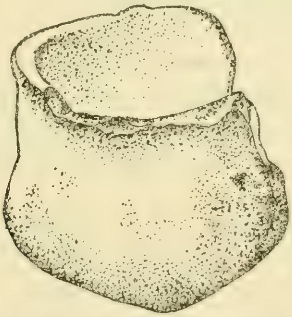

FIGURE 81.—Miniature pottery vessel (USNM 387097) from Scott County site, 14SC1. Actual size.

Among the several pottery wares represented in our Kansas collections, as described in preceding sections of this report, there are none that are likely to be confused with Scott Plain or Scott Micaceous. Sherds of the first were picked up by members of our party here and there in the Scott County region, at what were probably hunting or otherwise temporary camp sites. Both wares, on present evidence, appear to have a definitely western or High Plains occurrence in the State. Outside the State, presumably similar types have been described (Hill and Metcalf, 1942, pp. 179–185) from the Lovitt site in Chase County, Nebr., and elsewhere nearby. The majority ware in the

Nebraska sites is sand tempered, and corresponds to our Scott Plain; the mica-tempered minority ware is evidently analogous to Scott Micaceous. Noteworthy differences are apparent in certain details, however. Thus, about 30 percent of the Lovitt site sherds are simple stamped, as against less than 1 percent so treated in the Scott County site. Furthermore, vessel lips include flattened and everted examples, and about one-seventh of the lip sherds bear incised decoration. These differences, I suspect, are attributable to the relative proximity of the Nebraska sites to other archeological cultures, as for example, the protohistoric Pawnee, among whom simple stamping and lip incising were characteristic procedures. Despite such differences in matters of detail, I think there can be no doubt that the Scott County wares are closely and directly related to the more fully described pottery of the Lovitt site.

### EXOTIC SHERDS

Only four sherds in our collections, all from test No. 2 north of the pueblo, can be certainly regarded as of nonlocal origin. All are thickly shell tempered, have a light-gray to buff paste with a chalky "feel," and are softer (about 2–2.5) than the local wares. One is a rimsherd, with diagonally incised or "ticked" lip; another is a section of thick loop handle with a sort of sleeve at one end from being "riveted" into the vessel wall; the other two are undecorated and unmodified body fragments. In every respect they are indistinguishable from the shell-tempered sherds we found almost exclusively in sites on the lower Walnut River east of Arkansas City, and they are probably identifiable as Cowley Plain ware. Similar shell-tempered sherds occur as a small minority group in sites in Rice County, a nearer but perhaps rather less likely source.

Somewhat to our surprise, our excavations about the pueblo ruin produced no sherds of puebloan ware. Williston (1899, p. 112) was informed by a resident of Scott City that he had found "a good deal of colored pottery" in the ruin. Here also according to Martin (1909, p. 18), "Coiled as well as smooth pottery was found, but only a single piece that showed evidence of decoration. Some of this pottery has been submitted to Professor Hewitt, of Las Vegas, N. M., who . . . was of the opinion that all this pottery had been introduced from New Mexico, and had not been made in the vicinity of the building or village." His observation that " . . . the pottery found was in part composed of plaster of Paris, possibly obtained from the crystals of selenite scattered over the chalk exposures in the vicinity . . . " applies to none of the sherds we recovered, and we found neither coiled nor smooth decorated (painted?) fragments. There is no indication as to the number of puebloan sherds taken from the ruin, or the presence of other types comparable to Scott Plain and Scott Micaceous. If puebloan pottery in the ruin was scarce, its absence from our diggings in the middens is not so surprising. There is thus, unfortunately, no way of judging to what extent our midden findings parallel those in the pueblo, as regards ceramic remains.

Elsewhere, I have mentioned the recovery by A. T. Hill of a Tewa Polychrome sherd in the vicinity of roasting pits and caches exposed by lowered lake waters a few hundred yards north of our diggings. The material associated with the pits and caches is indistinguishable from our midden findings, and another camp or village site of the same peoples as those about the monument seems indicated. With due regard for the surface provenience, from a normally lake-covered site, of this sherd (pl. 69, *a*), it should be noted that Tewa Polychrome is a protohistoric ware. According to Mera (letter to Wedel, August 9, 1945):

> . . . A time range for this type runs from about the last two decades of the 17th, up to the early years of the 18th, centuries. The villages where it occurs, in concentrations sufficient to indicate manufacture, are situated along the Rio Grande, roughly from about the mouth of the Santa Fe River on the south to that of the Santa Cruz River on the north, a distance of some thirty miles . . . .

We shall return, in a later section, to a discussion of the chronological implications of this association. It would be interesting to know how this sherd compares in time and provenience with the puebloan materials taken from the ruin by Martin and by Williston's informant.

### EXOTIC SHERDS

Owing probably to the fact that most of our work was in refuse deposits, we found no unbroken pipes of any kind. Fragments, however, were relatively plentiful; as with the other ceramic remains, they were mostly reduced to tantalizingly small pieces, and so it is a very sketchy, though suggestive, glimpse we have of this particular artifact complex. Of some 33 fragments believed to be parts of pipes, 30 are of clay and probably represent upward of 25 separate objects originally. The other three pieces are stone, and come evidently from two pipes.

Among the clay-pipe fragments, six are characterized by a rather dark moderately coarse granular paste, with sand grains and commonly some mica visible on fresh breaks. Surfaces are unevenly smoothed, and the pieces give the impression of being the product of local craftsmen. Many of the remaining fragments have a fine even paste with few or no visible inclusions, appear to have been much better fired, and show a better surface finish. Some, at least, of these appear to have been imported, or at any rate to have been made by persons with a much higher technical ability than those who produced the preceding pieces.

As to form, three of the clay specimens are certainly of the tapered straight tubular "cloud-blower" type. One longitudinally split example (USNM 387123; pl. 69, *k*) is 95 mm. long with a maximum diameter of 25 mm. The stem bore is 7 by 40 mm., the bowl cavity 16 by 55 mm. In cross section the pipe is, or was, evidently circular throughout its entire length. Another specimen (USNM 386609; pl. 69, *i*) has a present length of 51 mm., with a diameter at the bit of 18 mm. and at the broken end of the bowl of 24 mm. The bit was evidently flattened; the bowl cavity, 17 mm. in diameter, is heavily caked. The third fragment (USNM 386733) is 65 mm. long, and also shows a flattened bit; the stem bore is 5 by 15 mm., whence the caked bowl cavity enlarges to at least 15 mm. diameter. Outside diameters are 13 mm. at the bit and 22 mm. at the broken end of the bowl (pl. 69, *g*). All these pieces are undecorated, and I think must be of local make.

Two other fragments (USNM 386587, 386850) show an obtuse angle or bend between the straight stem bore and the expanding bowl cavity, and are surely from bent-tubular pipes. They were at least 20 to 30 mm. in diameter but their original length and exact conformations are unknown. The first has a broken protuberance on the outside of the bend, somewhat reminiscent of the spur on early European trade pipes (pl. 69, *j*).

One other feature concerning pipe shapes must be noted. Of 12 or 13 pieces showing all or most of the bit, only 3 or 4 have a circular cross section. The other 9 show a flattened section, or one that is more or less lozenge shaped with rounded angles. Examples intergrade from the circular to the nearly flat form, with a rather striking difference between the two extremes of the series. It should be noted that in at least two instances, the flattening is associated with a sudden terminal widening (pl. 69, *e*; USNM 386679) or with an elaborate modeling or serration of the edges (fig. 82, *e*; pl. 69, *d*; USNM 386842) of the stem. Another small piece (USNM 386637, not shown), whose position in the pipe is uncertain, has a prominent longitudinal shoulder modeled on an angle of nearly 90°. These last three specimens are all of hard well-fired ware, light gray in color, with well-smoothed surfaces, and do not conform to the local pottery tradition.

Perhaps the most interesting pipe fragments from the site are 5 or 6 that bear incised decoration, and several with elaborations of form at the bit and bowl ends. The incising consists of fine lines enclosing or bordering small areas filled with minute punctations or very short stroked elements done with a very fine-pointed implement. These markings were evidently arranged in patterns, the overall appearance of which cannot be determined from the fragments available. Several line and dot design remnants are shown in figure 82, *a*, *b*, *c*, along with three instances of cross-hatched incising. The piece shown in plate

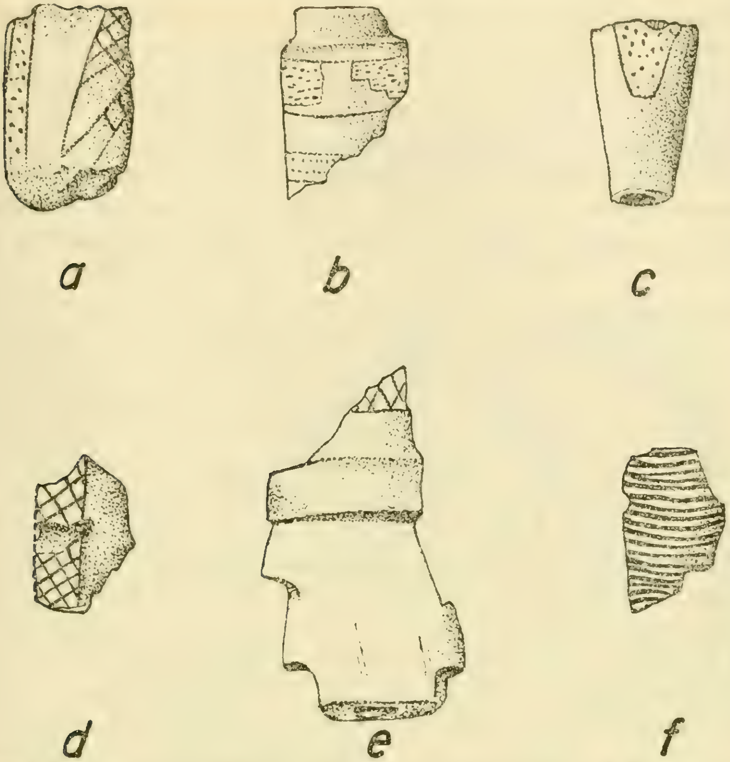

Figure 82.—Pottery pipe fragments from Scott County site, 14SC1, showing Rio Grande Pueblo influence in decoration or bit elaboration (*e*). Actual size.

69, *b*, (USNM 386878) is of interest further because of the well-made offset of about 4 mm. at the end of the bowl. The elaborate stem in plate 69, *d*, (USNM 386842) has already been noted. Not shown is a heavily caked bowl fragment (USNM 386972) with about 20 closely set but unevenly spaced parallel lines that apparently encircled the pipe; and a smaller piece (USNM 386808) with 5 parallel encircling lines.

The three stone-pipe fragments, we may note in passing, appear to have come from two pipes. One, of soft light-gray limestone, was apparently of the tapered tubular form. The other fragments are of a reddish stone flecked with white calcareous particles that dissolve in hydrochloric acid; the form of the pipe from which they came is indeterminate.

The pipes indicated by our series of fragmentary specimens must have resembled the more complete series from the Lovitt site in Nebraska (Hill and Metcalf, 1942, pp. 185–188), where tapered tubular clay forms with flaring bit, and bearing incised and finely punctate or pricked decoration, are said to be characteristic. As Hill and Metcalf have indicated, this is not a typical Plains form, and it has not been reported from any other archeological horizon in the Kansas-Nebraska area. As a matter of fact, the only comparable pieces I know from this region are those collected by Martin (1909, pl. VI, 13–18, and pl. VIII, 62) from the Scott County pueblo ruin. That a strong, and probably direct, puebloan influence must be recognized in these specimens is clear, I think. Some of our fragments certainly, and perhaps most of them, are from pipes that closely parallel Kidder's (1932, p. 156 ff.) Class I pipes from Pecos, either Type A ("round slim types") or Type C ("heavy fat type"). The "fishtail" form of mouthpiece, flattened and expanded laterally, is a characteristic of Kidder's Class II, many examples of which are further described as having "round collar-like bowl-ends of smaller diameter than the body proper." One such bowl end (USNM 386878) from our diggings has already been noted. The fine-line incising, punctating, and pricking, as well as the cross hatching, noted on Scott County pieces occur on Class II, Type A pipes at Pecos, as do rectilinear design blocks filled alternately with parallel lines, punctates, and other motifs (cf. Kidder, 1932, fig. 141 *g* and Martin, 1909, pl. VIII, 62). Finally, if further evidence of southwestern contacts in this matter is needed, I have an opinion from Mera, to whom several of our Scott County pieces were submitted for examination. Concerning the serrate-edged stem, the flared bit, and the "shouldered" fragment, all noted above, Mera (letter of August 9, 1945) observes that "All of the pipe fragments, No. 386842, No. 386679, and No. 386637 are unquestionably of typical Rio Grande style and would correlate nicely with the sherd [of Tewa Polychrome] in age." Two other fragments (USNM 386609 and 386778, the latter with cross-hatched and pricked decoration), according to the same observer, "do not conform to the prevailing fashions in early historic times as do the others. The character of the paste is also megascopically quite different from most Rio Grande examples familiar to me. Perhaps manufacture at the place of discovery might be conjectured if an intrusion of people from the west can be considered."

### OBJECTS OF ANTLER AND BONE

*Antler objects.*—Two antler-tip fragments show modification by man. One suggests the flattened tip of a scraper haft, such as those described by Hill and Metcalf (1942, p. 200 and pl. IX, fig. 1) from 25CH1 and 25FT9. The other has a nicked and scarred tip (fig. 83). Another section of antler shaft has been cut off at one end, broken diagonally at the other; it may be rejectage. A fourth piece seems to be thinly scraped antler plate, apparently cut from the shaft where a branch tine occurred. The edges are cut, the ends broken, but striations suggest attempts at scraping or rubbing down the

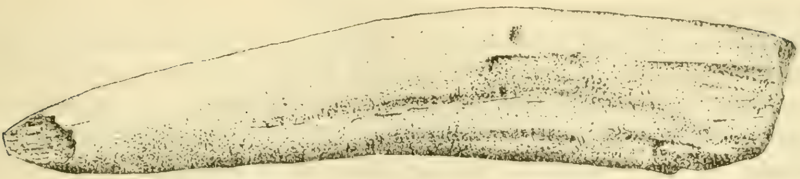

FIGURE 83.—Worked and polished antler tip from Scott County site 14SC1.

original surface. Both deer and elk antler are represented by these specimens.

*Scapula digging tools.*—None of these are complete, but there are a great many dressed and worn fragments that without doubt can be so identified. The fragments show sharpening of the vertebral border, removal of the scapular spine, trimming of angles and borders, and partial or complete removal of the head of the bone. The sharpened vertebral border is usually beveled and worn to a high polish. The scar left in removal of the scapular spine is nearly always jagged and irregular, in no case ground smooth as in the Cowley County specimens noted elsewhere. None have any trace of the socket or groove at the head that characterizes the Rice and Cowley County implements. In one case, where the head was only partially removed, it was whittled down from both sides to about one-third of its normal thickness, and the adjacent dorsal and ventral surfaces of the bone have been flattened. The range in size and form, and the exact manner of hafting, remain uncertain.

*Awls.*—Of 65 awls and awl fragments, 14 were fashioned from mammal leg bone and the remainder from mammal ribs. Those of leg bone include 2 where the head of the bone has not been modified except by the original splitting; they are 109 and 120 mm. long, much worn, and may be of deer metapodial (pl. 70, *l*, *m*). Another specimen, 77 mm. long, has the head partly worked down. Six awls, from 47 to 157 mm. long, were improvised from irregular splinters modified only by the rubbing down of one end to make a piercing instrument; the shaft and butt are always ragged and unfinished (pl. 70, *o*, *p*). Five other awl tips are too fragmentary to be classified.

Awls of mammal rib include one rounded butt fragment, carefully dressed on all surfaces but with the cancellous tissue exposed in the initial splitting only partly smoothed. Nineteen others are made from face splinters of split rib, pointed at one end but, unlike the preceding piece, not otherwise finished on the sides, edges, or butt. Varying in length from 45 to 162 mm. this group includes the heaviest piercing tools from the site (pl. 70, *n*).

Twenty-nine awls, and possibly two additional fragments, comprising in all nearly half the awls from the site, were made from the edge of a bison rib or the anterior margin of the neural process of the same animal. They are triangular, or nearly so, in cross section, with rounded corners, and one flat side nearly always shows a faint trace of cancellous tissue. The butt is rounded or rounded conical, and the shaft tapers quite evenly to the tip. Complete examples are 60 to 98 mm. long, but there are broken pieces unquestionably of the same type that were not less than 168 mm. long. Maximum diameter is 12 mm., but few exceed 8 mm. Two or three have somewhat flattened tips, and possibly should be classed as polishing tools. These awls are about as well made as any from the site, and though not so heavy as the split rib specimens, they must have been a serviceable and efficient instrument. Their near identity with the most common awl type at Rice County sites should be noted (pl. 70, *q*, *r*).

In the overwhelming preponderance of awls made of split ribs and neural spines as contrasted to leg bones, the Scott County site again conforms closely to the Lovitt site (Hill and Metcalf, 1942, p. 196). Both of these types also occur at Lower Loup Focus sites in east-central Nebraska, but in what proportions, relative to one another and to split leg-bone awls, I am not able to say (cf. Dunlevy, 1936, p. 197).

*Fleshing tools.*—One complete, or nearly so, specimen, and five fragments were found; all were apparently made from bison metatarsals, originally with the ankle bones attached. In most cases, these latter have become detached through decay of the ligaments and are lost, so that only the modified metatarsal or a fragment remains.

The most nearly complete specimen (pl. 71, *a*; USNM 387009) includes the metatarsal and some of the ankle bones, and has an overall length of 208 mm. The metatarsal has been shaped by cutting diagonally downward from the anterior surface so as to remove the distal end and produce on the posterior wall a rounded gougelike edge further sharpened by beveling from the interior surface. The posterior face, just above the working edge, has fine striations whose meaning is not clear. The blade is somewhat battered, but shows no trace of serrations.

Of the remaining five specimens, two consist of the metatarsal only and three of short sections of metatarsal including the working edge. One of the former (pl. 71, *b*) has 17 narrow notches cut into the working edge, the other is unnotched; and in both the blade is beveled from the posterior surface. They are 163 and 158 mm. long. The three fragments, from 82 to 103 mm. long, have 13 to 14 serrations each on the sharpened end (pl. 71, *c*, *d*).

Similar implements, usually serrate-edged and often with iron blades, were widely used in historic times by the Plains and other tribes (Wissler, 1912, p. 58; Mason, 1891, p. 589; Fletcher and La Flesche, 1911, p. 343 and fig. 70) for removing bits of flesh and fat from animal hides. Archeologically, they have been reported from several historic, and at least one protohistoric, Pawnee sites in Nebraska (Wedel, 1936, p. 84, and pl. 10, *e–k;* Dunlevy, 1936, p. 198 and pl. 14D) ; from the Lovitt site (Hill and Metcalf, 1942, p. 198) ; from Arikara (Strong, 1940, p. 370), Mandan (Will and Spinden, 1906, p. 169), and Cheyenne (Strong, 1940, p. 375) sites; and from the Hagen site in Montana (Mulloy, 1942, p. 71). Curiously enough, we did not find them at any of the protohistoric sites in Rice and Cowley Counties, Kans., though I did pick up one small fragment on a culturally related site near Larned at the mouth of Pawnee Creek. At Pecos several specimens were found (Kidder, 1932, p. 233) in rooms and kivas " . . . of post-Columbian date, and most of them . . . were apparently not deserted before the latter part of the eighteenth century." Earlier occurrences should be noted, such as Jenks' (1932, p. 461) Arvilla gravel pit specimen and two notched deer metapodials from a Woodland site in Valley County, Nebr. (Hill and Kivett, 1941, p. 166). No comparable serrate-edged pieces have yet been reported in the Upper Republican and contemporary Central Plains complexes, though these intervene temporally between the Woodland and the above-listed protohistoric and historic occurrences.

*Rib implements, striated.*—Sixteen specimens have been fashioned from sections of bison rib, varying from 114 to 176 mm. in length by 22 to 33 mm. wide. In each, one end of the rib has been neatly cut off; the other was either cut and irregularly broken off, or else shows only a ragged fracture, though in either case this broken end shows some evidence of smoothing. The cut end is squarish or somewhat rounded, and in most cases the external surface of the bone has been beveled or sloped back by oblique grinding of the cut end (fig. 84, *a*). The most distinctive feature of these objects is a series of fine transverse striations (pl. 71, *f–j*), beginning just above the cut end, running entirely across the bone, and covering from 10 to 40 mm. of its length. The striations are straight or nearly so, closely bunched, and in some specimens have worn the bone surface down as much as a millimeter or more. Implements with both ends cut and finished have a striated zone at each extremity (pl. 71, *f*, *g*). Invariably, the striations occur on the internal surface of the bone opposite the beveled facet where the latter is present; the adjacent cut end is usually smoothed or rubbed down, but not as if from extended wear. The scratches look as if they had been made with a sharp flake or flint knife used with a sawing or cutting motion, but they are not efforts at cutting through the bone nor do I see how they could have resulted from flint chipping.

Whatever their use, these objects differ widely from the scored rib sections, variously designated as musical rasps, tallies, etc., that occur

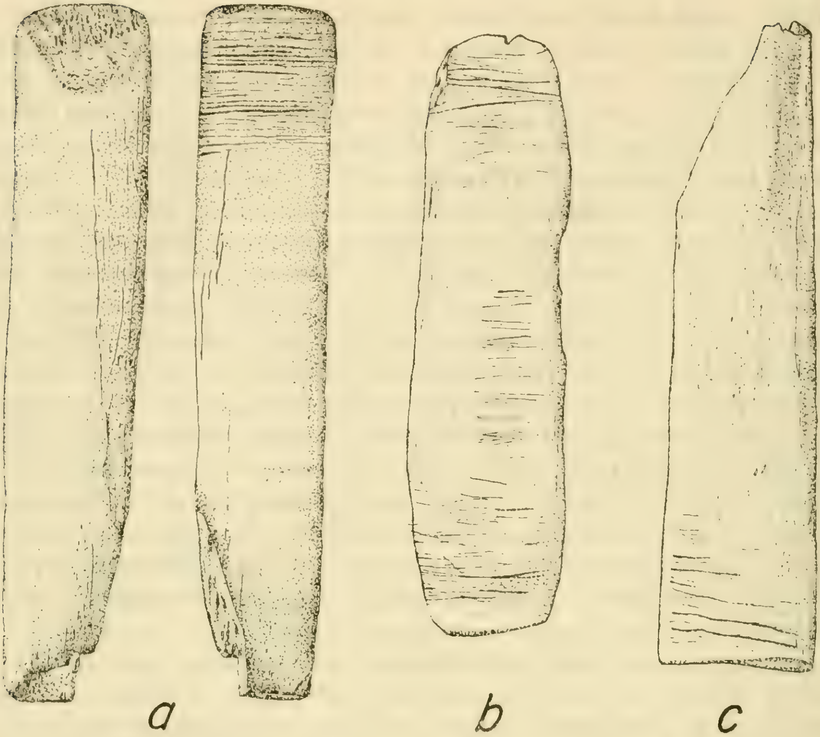

FIGURE 84.—Finished and transversely striated rib implements from Scott County site 14SC1. Length of *a*, 13.5 cm.

in such numbers in protohistoric and historic Plains sites; the striations are much finer, shallower, and more closely bunched than the bold transverse scorings on the "rasps", and the implements show rather more care in shaping. Martin reports none of the striated specimens from the pueblo ruin, though he does figure (Martin, 1909, pl. VII, 27) a section of scored rib; we, on our part, found none of the scored ribs in the midden excavations. The striated implements seemingly have not been reported from other Plains sites, and I have been unable to find a description of comparable objects elsewhere.

*Needle fragments.*—Four narrow dressed strips of bone appear to be from needles. Two are 55 and 62 mm. long, slightly curved, and about 5 mm. wide, with sides and edges carefully smoothed. One end of each is broken; the other end is cut off square, and there is a 2 mm. perforation 4 to 6 mm. from the butt. The other fragments, 23 and 40 mm. long, are broken at both ends and have no perforations, but in width, thickness, and finish are like the foregoing specimens (pl. 70, *g*).

*Bone arrowpoint*(?).—This is 69 mm. long by 5 mm. in diameter, in form straight, tapered, and circular in cross section. One end is pointed; about 8 mm. from the other end, the taper becomes more abrupt, developing into what suggests a stem for insertion into a hollow shaft or foreshaft. This latter feature seems to rule out the possibility of an awl, and may mean that a projectile point is represented. The piece is well finished but not polished (pl. 70, *h*).

*Flaking tools* (?).—Four objects made from the edge of a mammal rib or neural spine somewhat resemble a common form of awl from the site. However, they are generally heavier and not as well finished, and the rounded to conical butts are nicked and roughened. Their identification as flaking tools seems more plausible than the view that they represent crude awls. They vary in length from 55 to 115 mm. (pl. 70, *i*).

*Objects of cancellous bone.*—There are two of these. One is irregularly wedge shaped, with smoothed surfaces and thin edges; it measures 34 by 31 by 6 mm. Despite the absence of pigment residue, the piece suggests in shape and size the bone paint applicators of the historic Plains tribes. A second piece, 38 by 35 by 15 mm., is elliptic in form, thinning slightly to a moderately thick edge. As with the preceding specimen, this retains no trace of the original compact surface bone. Both were doubtless fashioned from pieces of the innominate, femur head, or other large bones of the bison (pl. 70, *d*).

*Tubular beads.*—There are 56 complete tubular bone beads, besides perhaps a dozen additional fragments. All were made of bird or small mammal bone, from which the articular extremities have been cut. Two bones showing this process were found, with one extremity detached, the other grooved but not gone. Beads vary in length from 14 to nearly 90 mm. Nearly all are plain and undecorated but often with a use-polish, and many show a slight curvature. The only decorative attempts are faint encircling incisions about 3 to 6 mm. from each end of two or three specimens. These objects were found in all parts of our diggings and, because they could be easily made from materials readily available, were no doubt popular among the natives. The table below shows their range in length and diameter (pl. 70, *b*, *c*).

TABLE 17

| Length<br>Diameter | 0–15 mm. | 15–30 mm. | 30–45 mm. | 45–60 mm. | 60–75 mm. | 75–90 mm. | Total |
|---|---|---|---|---|---|---|---|
| 0–4 mm | | 2 | 1 | | 1 | | 4 |
| 4–8 mm | 1 | 9 | 19 | 17 | 1 | | 47 |
| 8–12 mm | | 1 | 1 | 2 | | 1 | 5 |
| Total | 1 | 12 | 21 | 19 | 2 | 1 | 56 |

*Bone whistle.*—This specimen, incomplete, is made of bird bone like that used in the larger beads. It is now 79 mm. long, with one end finished, the other broken. About 10 mm. from the finished end is a hole 4.5 mm. across, rather ineptly made by sawing or whittling the shaft with a flint flake. I cannot say whether this was actually a whistle with a single aperture, as seems likely, or alternatively, was the end of a flageolet with a series of stops. Martin (1909, pl. VII, 25) figures a "bone piccolo" with a large stop at one end and 2, or possibly 3, small stops at the other. We found no evidence of this latter type in our work, but its presence in Martin's collections is, of course, one more bit of evidence for southwestern influences (cf. Kidder, 1932, p. 249) at the Scott County pueblo site (pl. 70, *a*).

*Worked bison hyoids.*—Two flattened objects with cut ends were made from the hyoid bone or stylohyal of the bison; neither is perforated or decorated, though on one the ends have been smoothed. They measure 28 and 48 mm. in length; their purpose is not known (pl. 70, *f*).

The end of a third hyoid is evidently rejectage from the manufacture of pieces like the above. The shaft was cut from both surfaces until the central cavity was reached, and the extremity was then snapped off. The remaining portion of the shaft above the cut end is smoothed, suggesting that the bone had been rubbed down and polished before the shaft segment was detached.

*Bracelet fragment* (?).—This is a thin plate of scraped bone, measuring about 50 mm. long by 32 mm. wide by 1.5 mm. thick. The edges are rounded and smoothed, the ends broken; the piece is transversely flat and longitudinally curved. The convex upper surface has been well smoothed, whereas the concave face shows striations suggesting traces of cancellous structure. There is no ornamentation. Purpose of the piece is unknown; it may be part of a bracelet or bow guard.

*Bone knife.*—A thin flat subrectangular piece, measuring 28 by 65 mm., has been cut from the blade of a scapula digging tool. One long edge shows the thin beveling of the original tool blade; the other edges have been rounded and smoothed, beyond doubt purposely. The piece may have been a "squash knife" or something for similar use.

*Perforated objects.*—There are two of these. One (pl. 70, *e*) is from a thin rectangular object 28 mm. wide with straight edges and one squared end. Near this end are two small holes about 15 mm. apart. The other end is broken. The second piece is longer, narrower, and less regular, with a single small hole near one long edge.

### OBJECTS OF CHIPPED STONE

Chipped stone artifacts were present in considerable numbers, though generally speaking, they showed less care or skill in manufacture than did those from the Rice and Cowley County sites. There was, moreover, a rather more limited range in artifact forms at the Scott County site. Raw materials included brown jasper, chalcedony, moss agate, variously colored cherts, and a very little obsidian. Fossiliferous Florence flint was not found, and if known locally, must have been very rare.

*Projectile points.*—There are 99 of these. Characteristically, they are small, thin, well made, with bifacial retouching, a length varying from 15 to 33 mm. and averaging between 18 and 25 mm., and a width of 9 to 16 mm. In form, 78 (78+ percent) are triangular and unnotched, with base slightly convex or straight and edges straight or slightly convex. Eleven others (11+ percent) differ only in having a pair of small lateral notches about 3 to 6 mm. above the base. Six have a rather markedly convex base, as though the corners of a simple triangle had been cut off (pl. 72, *a*, *b*).

The remaining four points are somewhat larger than the majority of the triangular specimens, from which they diverge chiefly in being thicker, relatively broader, more coarsely flaked, and in having barbs or shoulders and an expanding stem with convex base. The most nearly complete example measures 29 by 19 by 4.8 mm.; the others were apparently of comparable size. I suspect that these were not of local manufacture; similar pieces occur on mixed hunting sites throughout the region, and our specimens may have been picked up by hunting parties from the Scott County site and carried back to their village. I am not able to suggest, however, the specific cultural horizon to which points of this type should be referred (pl. 72, *d*).

Not included in the above count are three tiny chipped objects somewhat suggesting reworked triangular points (pl. 72, *c*) but possibly intended for some other use. They range in base width from 11 to 13 mm., and in length from 10 to 15 mm.; in two, width slightly exceeds length. Two have a slight shoulder between the retouched point and the basal flange; in the third the point is off-center. It is possible they were mounted in wooden or bone handles and used as reamers, scarifiers, gravers, or for other delicate incising or cutting.

*Drills.*—Thirty-four complete and nearly complete drills, and fragments of 6 or 7 others, came to light. The prevalent form has a slender carefully chipped shaft 10–30 mm. long, elliptical to quadrilateral in cross section, which expands abruptly into a large flat base representing the original flake with edges slightly or not at all retouched. The size and shape of the basal flange varies according to the conformations of the original spall. The two largest examples measure 60 mm. in overall length, though most are under 50 mm. Retouching of the base edges, where present, was just enough to remove the sharp edges and angles. There were 28 drills of this type (fig. 85, *c;* pl. 72, *f*–*h*).

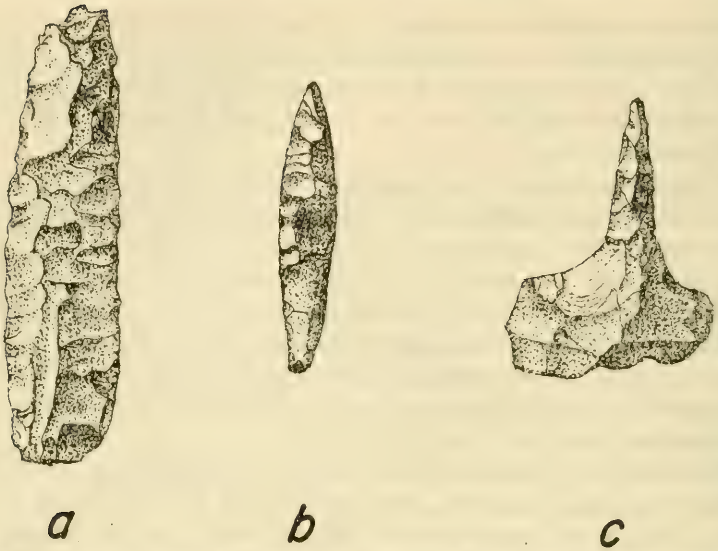

Figure 85.—Straight-shafted and expanded base drills from Scott County site, 14SC1. Actual size.

Three specimens resemble the above in having the abruptly widened base, but differ in that the base is much smaller and has been retouched all around to give a subrectangular to oblong outline. In these, the retouching is somewhat inferior to that on the preceding; shafts are 13 to 27 mm. long, overall length 29 to 53 mm.

There are two plain-shafted drills. One, with both ends damaged, is 61 mm. long; it has a thick lenticular cross section, and is rudely flaked. It somewhat suggests the large heavy plain-shafted "pipe" drills from Rice County but is smaller, less well made, and lacks the characteristic blunting of the long edges (fig. 85, *a*). A somewhat similar but smaller drill, 39 mm. long, is better made; it has a triangular cross section and shows wear at both ends (fig. 85, *b*). The remaining specimen, 30 mm. long, has a quadrilateral cross section; it is widest about one-quarter of the distance up from the butt, which is rounded and shows no wear.

*Knives.*—No complete knives were recovered in our work, but approximately 134 fragments showing one edge retouched from both faces are tentatively classed as cutting tools (pl. 73, *d–f*). Because of their invariably broken condition the size and shape of the knives remain uncertain. Some may have been improvised from suitable spalls of generally elongate outline, but there are hints of lanceolate, subrectangular, or ovate forms; and an occasional thin carefully worked fragment suggests that there must have been some very fine examples of flint-working among these tools. There is evidence, too, that beveled knives were occasionally used, but of these there are not more than a dozen fragments; they indicate a tapered blade, and there is one incomplete piece that suggests the four-edged beveled "Harahey" type (cf. Hill and Metcalf, 1942, p. 190). There were also some relatively large rough specimens that seem to have been upward of 12 to 15 cm. long by 6 mm. wide, with well sharpened edges. It is possible that these ought to be classed as choppers or perhaps as hide scrapers, though in any case their use is largely conjectural.

Martin (1909, pl. VII, 32 and 36; pl. VIII, 57 and 58; and pl. IX, 84) illustrates a number of cutting, chopping, and/or scraping tools that probably do not differ much from the pieces represented by our series of fragments. I am unable to explain the extraordinary abundance of broken chipped artifacts and the very few whole pieces we found. The fact that nearly all of our material is from middens may be a partial explanation, yet even here one would expect rather more intact pieces than we obtained. One has the impression that artifacts were either subjected to very heavy use and unusually complete breakage or else that they were deliberately smashed up before being finally cast away.

*End scrapers.*—These, too, occured in relatively large numbers, and differed in no important particular from those at other Plains camp and village sites. The under side is flat or slightly curved, without retouching, and represents the unmodified original surface of the flake; commonly, the bulb of percussion is still visible at the smaller end. In form, the scrapers are subovate to subelliptic in outline, but with a number of specimens quite irregular in shape. The wider end in all cases has been chipped back to an angle of 45°–80°, and the maximum width and thickness usually occur here. The long edges are retouched, the narrow end less often so. The dorsal surface is variable; sometimes it shows only two or three large broad flake scars, and is low and flattish; in other specimens it is strongly ridged. Several specimens have a suggestion of a small protuberance or graverlike point, this usually occurring where the broad working end meets a lateral edge (cf. Champe, 1949, p. 289; Gunnerson, 1959). Length ranges from 20 to 80 mm.; but of 281 specimens only 79 (28.1 percent) are under 38 mm. and 129 (45.6 percent) are between 38 and 57 mm. They thus average appreciably larger than the end scrapers from Rice County protohistoric sites, and also show less care in shaping or skill in flaking (pl. 72, *i*, *j*).

*Side scrapers.*—This group, comprising nearly 200 specimens, includes unshaped pieces with the edge, or edges, retouched from one side only. Most are irregularly shaped spalls and flakes, up to 100 mm. long and 20 mm. thick. One surface is flat or nearly so, the other is ridged or otherwise convex, and the edge retouching is always done on this convex side. In some cases the working edge is blunted from use. For the most part they suggest improvisations, and contrast markedly with the carefully shaped end scrapers. They approach the knives rather closely, however, except in the manner of retouching the edge, and the distinction here made between knives and side scrapers may not reflect a similar dichotomy of use among the natives. Probably cutting and scraping could be done about equally well with either tool.

*Hide scrapers.*—There are at least 10 or 12 heavy edged implements that almost certainly represent the large hide scrapers characteristic of the historic Plains tribes. Most are broken, but they were evidently more or less elliptical, and measured up to at least 100 by 70 by 20 mm. One long edge was retouched, and the ends were partially so treated; the other long edge, constituting the back, was left blunt for convenience in grasping (pl. 73, *a*). Similar objects, but usually of quartzite rather than of brown jasper as here, are common at Pawnee sites in Nebraska (Strong, 1935, pl. 1, fig. 2, a, d; Wedel, 1936, p. 76); and in 1933 I saw identical implements still in use among the Comanche near Walters, Okla.

## OBJECTS OF GROUND AND PECKED STONE

*Mealing slabs and manos.*—Only one mealing slab was found by us, and it is apparently incomplete. Of limestone, it measures 235 by 135 by 48 mm., and there is some evidence of shaping by percussion or spalling at each end. The upper surface is worn in very slightly concave manner.

Manos include three fragments and one whole specimen (pl. 73, *i*). The latter is of pinkish quartzite, measures 103 by 65 by 37 mm., and has one worn working face (fig. 86). One fragment is from a much larger stone that may once have been as much as 200 mm. long;

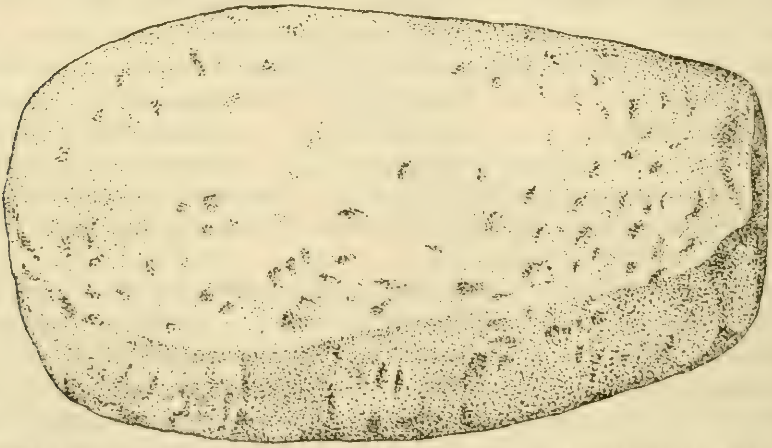

FIGURE 86.—Single face mano of quartzite from Scott County site, 14SC1. Actual size.

it measures at present 100 mm. long, with both ends broken, and is 110 mm. wide by 45 mm. thick; the surfaces seem to be little worn. The remaining fragments are unquestionably from long-used specimens, prism shaped or triangular in cross section, with one broad and two narrower grinding surfaces. The larger of these manos was at least 95 mm. wide by 35 mm. thick.

The previous excavations at the pueblo netted a larger series of grinding implements than did our work; Martin (1909, pl. VIII, 60 and pl. IX) recovered several flat-surfaced metates and a number of manos, the latter including both short and long round-ended forms. A puebloan corn-grinding complex seems indicated by the available evidence.

*Mortars or anvil stones.*—There are two of these, one of diorite, the other of quartzite. Both are irregular, unshaped boulders not exceeding 140 mm. in greatest diameter and 65 mm. in thickness. One or both of the larger surfaces are slightly concave, either from grinding or from pounding. The specimens resemble the small mortars, used on a rawhide basin, on which pemmican was pounded by the Dakota and other historic Plains tribes.

*Shaft straightener.*—This is a flat-bottomed elliptical block of fine-textured limestone, with planoconvex cross section transversely and longitudinally. It is incomplete, but assuming a general symmetry of outline the original length and width were each approximately 55 mm., thickness 28 mm. Across the highest part of the convex surface is a smoothly worn transverse groove 15 mm. wide by 5 mm. deep. There is a hint of an attempt to mark out by pecking a longitudinal groove on the flat base. This is not a typical Plains implement, but basically it is like the southwestern shaft straighteners (cf. Kidder, 1932, and p. 284) and may have been used for a similar purpose.

*Shaft smoothers.*—Fragments of elongate-shaped sandstone blocks, bearing a longitudinal groove, were common everywhere in the deposits. None of the pieces are large enough to show the size and shape of the original objects, but they do have the groove on a flat surface, with rounding sides and bottom, while a few pieces show the boatlike ends of the common paired buffers. It is probable, though not proved, that they were of that type. In size, the fragments suggest smaller, more slender forms than those we found on Rice County sites, and there is perhaps a somewhat greater variability in shape (cf. Martin, 1909, pl. VII, 19–24). The material is usually a fine-grained, light-colored, very friable stone, with an occasional dark red-brown piece; and as Martin (op. cit.) points out, it was probably obtained from outcroppings of the Dakota sandstone more than 100 miles to the east of the site.

*Sharpening blocks.*—There are a few other irregular, and apparently not intentionally shaped, sandstone blocks bearing short, often convergent or even crisscross grooves of varying width, depth, and length. These, I suppose were for sharpening awls, needles, and similar objects.

*Pipe blank* (?).—This is a carefully shaped block of smooth fine-grained limestone, nearly square in cross section; it measures 108 mm. long by 22 to 25 mm. in width and thickness. All four sides and both ends have been dressed flat, and are unmarked except by fine grinding striations. Its purpose is unknown, but the size and proportions suggest that it may have been a blank for a tubular pipe (pl. 73, *j*).

### OBJECTS OF UNWORKED STONE

*Hammerstone.*—There is but a single example in our collections. It is of gray quartzite, rounded, and measures about 50 by 60 mm., with the former edges and angles rounded off from long-continued hammering or pecking. This single occurrence is probably a very unreliable indicator of the extent to which such objects were once present, and numbers of the stones may have been overlooked in the digging.

*Hematite.*—Several small bits of soft friable hematite were noted at various points in our work. There were, in addition, two much harder and more metallic pieces, both with well-marked wear facets. One of these was triangular, 24 by 15 by 8 mm.; the other was quadrilateral, with all surfaces ground flat, and measured 52 by 38 by 16 mm. Both give a bright red-brown streak, and were undoubtedly used as sources of pigment.

*Marcasite concretions.*—No less than 24 of these were found. Most are flattened circular or subcircular in outline, biconvex in cross section, and vary from 12 by 20 mm. to 25 by 55 mm. There is one reniform and one pear-shaped specimen. About half have a rusty red friable surface; the others are dull gray and hard. None show any evidence whatever of alteration by man, and they seem to be just as they were when found by the natives. For what purpose they were brought into the village I do not know, but their comparative abundance suggests something more than idle curiosity. As to their source I am also uncertain; we found none in the adjacent valley during our scouting trips, though the broken terrain outside the Park to the north was not very closely examined. We did find numerous concretions of the same sizes, shapes, and material, weathering out of soft shale beds along Salt Creek just below the Pottorff site about 14 miles east of Scott County pueblo. Whether this or some nearer deposit was the source of our archeological specimens, I cannot say (pl. 73, *g′*).

*Miscellaneous objects.*—From test 2 came a large unworked shell of a Cretaceous oyster, perhaps brought in as an oddity; it could have come from a comparatively short distance.

A bifurcate object of rough-surfaced stone with rounded ends, and measuring 115 by 67 by 21 mm., is apparently inorganic and of concretionary origin. It, too, is unworked.

From test 2 came a flat rhomboidal crystal of gypsum; it looks weathered but is unworked. It measures 55 by 35 by 13 mm.

### OBJECTS OF SHELL

Molluscan remains and worked shell were exceedingly scarce. Less than a dozen pieces have certainly, or probably, been worked. Most of these appear to be from bivalves, perhaps thin-shelled fresh-water mussels taken out of the nearby creek; but they are too fragmentary or too much worked to permit species identification.

Four specimens show drilled perforations. Two of them are rectangular, measuring 14 by 25 mm. and 11 by 18 mm.; each has a small hole near the cut end and is broken at the other. A third piece, 10 by 18 mm., is pierced near one end and has another hole partly broken away at the other. The fourth piece is subtriangular and incomplete, with one hole. In all these examples, the drilling was mainly from the concave surface of the shell, with just enough work on the external surface to prevent the drill from breaking out a ragged hole (pl. 70, *j*).

Four other pieces, cut and shaped to a rectanguloid form, show no drilling.

Of interest is the presence of at least three specimens certainly of foreign provenience. One is a broken univalve, identified as *Olivella dama* Mawe, which inhabits the Gulf of California off the west coast of Mexico. It is well worn and polished, but has undoubtedly been spire-lopped for stringing on a cord. Two disk beads, 6 and 9 mm. in diameter, are apparently also of *Olivella* shell; the larger one is saucer-shaped and both have a 2.5 mm. central perforation (pl. 70, *k*). These disk beads, as also the spire-lopped piece, are all common types in the Southwestern United States; and I think it very probable that not only the shell but probably the finished beads themselves were imported into Scott County from the pueblo area.

### OBJECTS OF EUROPEAN MANUFACTURE

European trade or gift items were scarce, but since we, as well as Martin, encountered them inclusively at several points there can be no doubt of their association with the archeological complex here represented. That a French or Spanish trading post ever existed on this spot, as was once supposed, is exceedingly doubtful; the metal and glass so far found is no more than would be expected on a site whose occupants doubtless roamed widely on hunting trips and occasionally came into contact with European traders, adventurers, or colonists. All of our metallic specimens are too heavily oxidized to be recognizable as to their make and source, and in most cases even the identity of the object represented is not certain.

Objects of iron include three specimens from test 2, all at depths of 17 to 21 inches, one from test 3, and one with no provenience stated. From test 2 came a flat piece measuring 95 by 25 mm., with one thick straight edge and the other curved; one end tapers to a point, the other suggests a shank for insertion into a handle. The piece rather strongly suggests the blade of a sheath knife (pl 73, *g*). Another smaller flat piece with one curving edge and a small hole as if for riveting may also be from a knife blade. The third piece, 60 mm. long, is slender and tapered, and possibly is an awl. The object from test 3 is very heavily oxidized but it, too, appears tapered, and may be another awl fragment; it is 44 mm. long. The fifth piece is square at one end, about 2.5 to 3 mm. in diameter, and tapers to the other end; it is 47 mm. long, and suggests still another awl tip.

From test 1, at a depth of 18 inches, was taken half of a much weathered, rather crumbly, pale blue glass bead. It has a diameter of 6 mm., a length along the perforation of 5 mm., and the perforation is 1.5 mm. in diameter. So far as I can judge, it conforms rather closely to the blue glass beads from the Tobias site in Rice County, and represents a trade type widely used over a considerable period of time.

We found no objects of copper.

In addition to the above finds in the middens, it should be noted that during the clearing of the pueblo ruin, Martin (1909, pp. 16 and 17, and pl. VIII, 59) recovered a broken iron axhead from room II, and in room V found "half of a clam shell, which had been sawed lengthwise with a toothed saw, the tooth marks being very plainly apparent." This latter specimen I have not examined, and so I cannot judge the validity of the observation. Writing prior to Martin's excavations, Williston (1899, p. 112) quotes from a letter an unconfirmed report that "beads and crosses" had been found here, though the precise spot is not specified. In any event, the evidence from excavation is clear and incontrovertible, and there can be no doubt that the Indians who inhabited this spot had been in contact, directly or indirectly, with Europeans. In view of the evident contacts with puebloan peoples, I would suspect further that the metal and glass goods came from the same region and were probably of Spanish origin, though the possibility of French provenience cannot be ruled out.

### DISCUSSION AND CORRELATIONS

To students of Plains archeology, it will be readily apparent that the artifact materials described in the foregoing pages comprise a fairly representative Plains culture complex of early historic (protohistoric) times. There are a few items, such as the incised and flare-bitted clay pipes and *Olivella* shell beads, that are not ordinarily found in Plains sites; but such pieces constitute such a relatively small fraction of the total present that they can readily be explained on the basis of trade contracts with, or cultural influences from, the Rio Grande area. This heavy preponderance of typical late Plains artifact types is not altogether what I would have expected in view of the proximity of our diggings to what is apparently a ruined structure of puebloan, not Plains Indian, origin.

Comparison of our artifact sample with that reported by Williston and Martin from their excavations in the pueblo ruin indicates that their collections parallel in many ways our findings. Puebloan materials are clearly suggested in the coiled pottery briefly described by Martin (1909, p. 18), in the incised tubular clay pipes, and perhaps in the flageolet and the metates, all presumably taken from the ruin itself. Otherwise, the chipped projectile points, end scrapers, expanded base drills, knives and choppers, such ground stone objects as longitudinally grooved shafts smoothers and perhaps small grinders (anvil stones?), the bone awls, toothed flesher, scapula digging tool fragments, and, of course, charred corn, are in line with our findings in the refuse deposits outside the ruin. All this suggests that while the architecture and some of the furniture, such as the grinding trough and rectangular slab-lined hearths, and probably the nearby irrigation ditches, were undoubtedly of puebloan origin, the material culture in possession of the inhabitants was generally far less puebloan than it was Plains Indian in character.

Among the described and named culture complexes now recognized in the Central Plains, the Scott County site (14SC1) evidently finds its closest counterpart in the Dismal River Aspect sites of western Nebraska. I have already noted the close resemblances in ceramics, pottery pipes, and certain other artifact categories between 14SC1 and the Lovitt site, 25CH1, on Stinking Water creek in Chase County, Nebr. The Lovitt site lies approximately 140 miles, airline, almost due north of Scott County. The scene of extensive excavations by the Nebraska State Historical Society in 1939, the Lovitt site is the first Dismal River culture site to be fully described in print (Hill and Metcalf, 1942). As the type site for what is now termed the Stinking Water Focus of the Dismal River aspect (Gunnerson, 1959), to which have been assigned other sites in Dundy, Frontier, Harlan and Hooker Counties, Nebr., we may here carry further our comparisons of the complex just detailed from 14SC1.

First, with respect to the sites themselves. Each occupies a terrace location beside a small perennial creek and at some distance from the larger streams of its area. The Lovitt site covers some 75 acres of ground and is probably the larger; but the remains at 14SC1 are known to extend under Lake McBride and onto several terraces south of the flat on which most of our digging was done, and their total extent has not been determined. At 25CH1 were found the remains of two house structures—one marked by a circular posthole arrangement some 20 feet in diameter, the other by a five-posthole grouping about 11 feet in diameter, and both with central fireplaces. The pentagonal pattern is reminiscent, of course, of the similar structures identified subsequently by Champe (1949, pp. 286–288 and fig. 70), at White Cat Village, 25HN37, on Prairie Dog Creek near Alma, Nebr. At 14SC1, no posthole patterns suggesting structures were uncovered, though I suspect that stripping of larger areas than we uncovered might well disclose their presence. Irregular basins and pits occurred at both the Lovitt and Scott County sites, though the bell-shaped cache pits so characteristic of other protohistoric Central Plains horizons were rare or absent. The roasting pits at 14SC1 have no known counterpart at 25CH1, but they do occur at other Dismal River sites in the southwest Nebraska area (Hill and Metcalf, 1942, pl. 3, fig. 2; Champe, 1949 a, p. 288 and fig. 70, *d*). Both sites yielded some indications of burned corn and considerable quantities of animal bone refuse. At neither was there any indication of defensive works, of the refuse mounds characteristically scattered over the surfaces of many protohistoric village sites farther east, or of associated burials.

The characteristic pottery at both 14SC1 and 25CH1 was a relatively thin, hard, dark-colored ware, generally sand tempered; and mica tempered or micaceous sherds constituted a minority ware. At 14SC1, 95 percent of the sherds were plain surfaced and less than 1 percent bore simple stamping; at 25CH1, the proportions were respectively 69 and 30 percent. About 5 percent of the Scott County sherds were classed as micaceous, as against less than 1 percent of mica-tempered sherds at Lovitt. The plainware sherds (Lovitt Plain) at 25CH1 were usually better smoothed, "with a well polished, often shiny, exterior" that is rare on Scott County sherds. At 25CH1, 62 (about 15 percent) of the 425 rimsherds carried incised, punctate, or other decorative elements on the lip, as against 2 instances in 414 rims at 14SC1. Traces of incised body decoration occurred on a very few sherds from each site. From both sites there are straight clay pipes, sometimes incised and with clear indication of form elaboration.

At both 14SC1 and 25CH1, the characteristic projectile point was a small triangular shape, unnotched forms predominated strongly over notched, and stemmed points are decidedly in the minority. End scrapers and side scrapers were very plentiful at both sites, drills less so; at 14SC1, expanded base drills decidedly outnumber the straight or cigar-shaped forms, whereas at 25CH1 the two types occurred in about equal proportions, and there is another type—straight, with "a short thick protuberance on the edge, apparently about midway between point and center" that has not been reported from 14SC1. At both sites were found milling slabs, manos, anvil stones, grooved shaft smoothers, sandstone sharpening blocks, tubular stone pipes or fragments thereof, grooved mauls, and obsidian. Turquoise beads are reported from 25CH1 and from 25DN1, but have not been found at 14SC1.

With respect to bonework, the two sites again shared a number of traits. These included bison scapula hoes; bison metapodial fleshers, some with serrate edge, others smooth bladed; cancellous bone paint applicators; stemmed projectile points; and tubular beads. Also, at both there was a variety of awls, including flat split-rib specimens, others made from the edge of a rib or neural spine, round to triangular in cross section, and still others fashioned by merely sharpening bone splinters. Items found at 14SC1 but scarce or not reported from 25CH1 include transversely striated rib segments with one finished end, scored ribs, eyed needles, and awls made from split mammal leg bones. Conversely, epiphyseal hide dressers, rib shaft wrenches, pierced bison phalanges, antler scraper hafts, and incised bone tubes were found at 25CH1, but not at 14SC1.

Work in shell occurred at both sites, but very sparingly.

It should be obvious by this time that the cultural similarities between 14SC1 and 25CH1 are much stronger than are the differences. As we shall point out later, many of the items just listed for the two sites are by no means unique to them or to the Dismal River culture they represent, but are shared by such other protohistoric Plains complexes as Great Bend Aspect and Lower Loup Focus. Some of them, like metapodial fleshers, bone paint applicators, and certain awl types, occur also in late levels at Pecos and in later historic Plains horizons. In the Dismal River sites, however, they are associated with more or less distinctive potterywares, decorated tubular clay pipes, and roasting pits, and thus constitute a characteristic assemblage that can be delimited in time and space. The propriety of allocating 14SC1 to the Dismal River Aspect, as all students will recognize, is clear and indisputable.

As to the period of the occupation represented by 14SC1, there are also clear leads. The artifact assemblage in general immediately suggests to the experienced observer a protohistoric dating, as does the fact that White trade goods were present in very limited amounts. Our finding of Rio Grande pipe types in direct association with the local complex, and their linkage in respect to time of origin with Tewa Polychrome pottery from the surface of the site, point, as Mera has noted, to a period around the last two decades of the 17th and the early years of the 18th century. Interestingly enough, among the ceramic materials gathered earlier by Williston and Martin, other Southwestern pottery types have recently been identified by Tichy (Smith, 1949 a, p. 295), including "Tewa and Pojoaque Polychrome, 'Kapo' black ware, late red wares, and Rio Grande culinary wares. Taken as a group, these varieties indicate a late 17th to early 18th century date for the site." All this, of course, dovetails nicely with several dendrochronological dates from Dismal River sites in Nebraska, including one of 1706 for 25CH1 (Hill and Metcalf, 1942, p. 205), another of 1709 for 25DN1 (Hill and Metcalf, 1942, p. 205), and a third of 1723 for 25HN37 (Gunnerson, 1959). About the same order of time is suggested for the Dismal River stratum at Ash Hollow Cave (Champe, 1946, pp. 27, 47), partly on dendrochronological evidence.

The dating, on archeological and dendrochronological grounds, of the Scott County site circa 1700, and its allocation to the Dismal River Aspect, in turn now generally identified with the Plains Apache or Lipanans, has some ethnohistorical implications worth noting here. Neither the evidence assembled by Williston and Martin, nor that resulting from our more recent work, gives any indication that more than one culture period or time level are represented at 14SC1. Rather, the data strongly support the inference that the pueblo ruin and its appurtenances (slab-lined hearths, grinding trough, oven, etc.), architecturally anomalous in the western Kansas plains, were directly associated with the Plains Indian material culture complex manifested so strongly and consistently in all of our excavations around the ruin and on other nearby terraces along Ladder Creek. We have here, in short, the site of a Plains Apache community of circa A. D. 1700 that included a multiroomed stone structure, irrigation works, and other features clearly inspired by, if not the actual handiwork of, Pueblo Indians. The relative scarcity of recognizable puebloan traits in the artifact inventory generally may reflect either a short stay by the pueblo Indians or else their ready adoption, here or previously, of the everyday implements and utensils of the local residents.

This close association of puebloan with Plains Apache remains immediately recalls to mind certain late 17th and early 18th century Spanish documents relating to Pueblo-Plains relationships. As we have noted elsewhere, on at least two recorded occasions Indians from Taos and Picuris forsook their villages on the Rio Grande and fled eastward into the buffalo plains. One such fugitive group that left Taos circa 1664 was subsequently brought back by Archuleta, but from what point in the Plains is not certain. In another break in 1696, a considerable party from Picuris eluded the pursuing Spaniards and spent some ten years among the Plains Apache. These malcontents were led by Don Lorenzo, a Picuris chief; and when rescued from the Cuartelejo Apache in 1706, at their own request, by Ulibarri, they numbered more than 60 persons. From the itinerary in Ulibarri's diary of 1706, plus that in Valverde's report of his visit in 1719 to the Cuartelejos, Thomas identifies the location of El Cuartelejo as "approximately in present Otero or Kiowa County, Colo. . . . probably [at] the junction of Mustang and Adobe creeks" (Thomas, 1935, p. 264 n. 23). And this, if we follow the contemporary documents, seems indeed to be the locality to which they lead us.

Ulibarri's diary, in addition to the route traveled, records various details regarding the land of the Cuartelejos and their manner of living. It is perhaps worth noting that when Ulibarri's rescue party arrived at the "great settlement of Santa Domingo of El Cuartelejo," Don Lorenzo and the rest of the Picuris came out of some "huts, or little houses;" others of the refugees, described as completely destitute, were scattered about among other Apache rancherias (Thomas, 1935, p. 68). A detachment sent out to gather up these distant Pueblos collected 18 persons from the Rancheria of Sanasesli, 40 leagues distant (ibid., pp. 70–71). Thomas quotes from an 18th-century account of Ulibarri's journey, which says inter alia that the Apaches of La Jicarilla conducted the expedition "to El Cuartelejo, where had been restored the houses which the fugitive Taos Indians built in the past century" (Thomas, 1935, p. 262 n. 6). Have we, in these recurring remarks about the houses of the fugitives, a hint that they were utilizing habitations of more substantial or permanent nature than those of the Apaches—stone huts or small pueblos, perhaps?

Unfortunately for Thomas' case, there is no shred of archeological evidence, so far as I have been able to determine, for the former existence of an Apache-Pueblo community at the locality in eastern Colorado which he identifies as El Cuartelejo. That such evidence may yet come to light, I cheerfully concede; but as of this writing, there has been no independent confirmation of the "pueblo constructions, built by fugitives from New Mexico in the late seventeenth century [which] existed at El Cuartelejo in eastern Colorado." (Thomas, 1935, p. 268, n. 60). Nor, for that matter, have such constructions yet come to light at any other point in the Plains north of the Arkansas River, except in northern Scott County, Kans. And here the archeological findings directly contradict Thomas' further assertion (ibid.) that the ruined pueblo is "of greater antiquity" than the documented flight of the Picuris into the Apacheria. Quite the contrary; the site falls neatly into the proper time interval, as Williston (Martin, 1909, pp. 13, 18–22) argued half a century ago.

As I see it, then, the case for El Cuartelejo in eastern Colorado rests solely on the testimony of certain historical documents. That for Cuartelejo in Scott County rests on archeological evidence, including particularly the unique association of a pueblo ruin with Plains Apache cultural remains. If Scott County pueblo and its associated archeological materials is not the very Cuartelejo rancheria from which Ulibarri rescued Don Lorenzo and his Picuris compatriots (cf. Champe 1949 a, p. 291), then we must conclude that it was a simultaneously occupied community (Sanasesli?) in which pueblo Indians from the upper Rio Grande and Plains Apaches were residing together in the late 17th and early 18th centuries.

### YOUNG BURIAL SITE (14SC2)

So far as we were able to learn, no burials have ever been found in the immediate vicinity of the pueblo ruin, nor are there any mounds or other special features that might suggest their presence nearby. Some years before our investigations, however, in course of road construction about the north gate of the park, one or more graves were graded out. The drive that skirts the west shore of the lake here curves around the lower shoulder of a small but conspicuous butte known locally as Buzzard Knob, and leaves the park just beyond the spillway. On the left of the road, as it passes through the gate, is a sloping sandy bench bearing a sparse stand of yucca, sage, prickly pear, and coarse bunchgrass, and overlooked by modest cliffs of calcareous material. A few notched arrowpoints and a scraper were collected from this bench, but otherwise there was nothing to suggest that the spot had ever been of particular interest to the Indians. The burial area was on the east slope of the Knob, a few yards outside the park, and about 1¼ miles, airline, north-northwest of the pueblo ruin.

Our excavations began on a 40-foot front, at the top of the cut bank bordering the road, and were carried westward up the slope to a maximum distance of 35 feet. The area dug slightly exceeded 800 square feet, within which was found evidence of at least five separate interments. Except where disturbance by man could be detected the soil profile presented a comparatively simple picture. The topmost 4 to 8 inches were a light to moderately dark-gray sand, doubtless colored by decaying vegetation. Flint chips occurred in some numbers in this zone, and there were also bits of charcoal. Below this was a light-yellow to nearly white clean sand, containing rounded pebbles and small calcareous rocks. Abandoned and filled rodent burrows traversed this deposit in many places, introducing charcoal fragments and occasional small rocks to depths of 2 or 3 feet below the ground surface. This sand continues to an undetermined depth, which in places certainly exceeds 6 feet; its lower levels showed little color change but were more compact. At the south edge of our excavations there were a few larger limestone fragments below topsoil, but at no point did we reach bedrock or any suggestion of it.

*Burial No. 1.*—This lay near the north edge of the excavated area, 6 or 7 feet back from the edge of the bank, under a layer of irregular boulders some of which protruded slightly above the ground surface (pl. 75, *a*). The bones were badly broken and scattered; it is possible there were originally two bodies in the grave, but most of the remains seem to have belonged to an adult female. The grave proper, about 22 inches deep, appears to have measured approximately 48 inches north to south by 36 inches, but bone fragments had been scattered, or perhaps dragged by rodents, as much as 2 feet to the east. Most of the skull fragments lay at the south end of the presumed grave pit, though one large piece was at the opposite end. The small size of the pit argues against a full length interment, and I would suspect from the distribution of recognizable bone fragments that the corpse had been flexed with the head to the south. The feet were apparently doubled back against the buttocks with the knees toward the east, as if the body had been laid, or perhaps had slumped over, on its right side. Bits of red ocher were scattered about the grave; at the north end was a piece of tortoise shell; and there were two incomplete fresh-water mussel shells identified as *Uniomerus tetralasmus* (Say) in the pit fill.

*Burial No. 2.*—Ten feet due south of burial No. 1, at a depth of 11 inches, was an oblong area of mixed soil discolored by charcoal fragments. This measured 12 by 17 inches, with the long axis southwest to northeast. At the northeast end were a few small skull fragments, evidently those of an infant or very young child. At the southwest end, 8 to 10 inches from the skull pieces, and at a very slightly higher level were a number of toe bones since identified as those of "either a prairie wolf (*Canis nubilus*), or of some large domesticated wolf-dog cross." Near the center of the mixed area was a fragmentary mussel shell pendant or gorget, apparently of elliptical outline, with a partially broken-out perforation near the remaining end; originally, there may have been two perforations. Clustered over and above this pendant were some 30 or more tubular beads of bone, all badly weathered or etched by soil action. Eleven of these averaged 5 mm. in diameter by 10 to 16 mm. in length, were cylindrical to subtriangular in cross section; and showed no signs of incising or other decorative modification. Eighteen others had a diameter of about 8 mm., and a length of 11 to 27 mm. A few of these larger beads were somewhat barrel shaped, i. e., had slightly tapered ends; one had 3 encircling grooves, another a single groove. There were two ringlike specimens whose diameter exceeded their length.

*Burial No. 3.*—The loosely flexed skeleton of another adult, probably a female, lay about 3 feet northwest of No. 2 and 7 or 8 feet southwest of No. 1. No grave pit could be defined, and the bones were in clean white sand with little or no admixture. A few stones were noted above the skeleton. The maximum diameter of the burial was 43 inches, its depth 22 to 24 inches. The skeleton lay on its back, with the right knee folded back under the bent left leg. The left arm was slightly bent at the elbow, with the hand resting on or against the left knee. The right arm was strongly flexed over the chest with the hand at the left side of the skull. The skull was at the east end of the grave, turned slightly to rest on its left side against the right hand. No difficulty was encountered in determining the position of any of these features (pl. 75, *b*), because the bones were quite complete and with few exceptions were in correct anatomical alinement. Unfortunately, however, they were exceedingly soft and crumbly, so that little but the skull, innominates, and long bones could be preserved for laboratory examination.

There were several artifacts in direct contact with the skeleton. On the distal end of the right humerus lay the worked carapace of a terrapin, which fell apart at the sutures as it was taken up. I am not certain whether this was a receptacle or part of a rattle or something else altogether. Underneath, in a compact mass somewhat suggesting original deposition in a bag or pouch, were 55 or 60 undecorated tubular bone beads, a stubby bone awl, a large stemmed projectile point, several scraperlike flints, and four spalls. A perforated mussel shell and a single tubular bone bead lay against the left wrist, and two or three inches below the point where the left ulna touched the left knee was another large section of terrapin carapace. There is not the slightest reason to doubt that all these objects had been placed in the grave at time of burial, and that they represent mortuary offerings.

The beads are of two sizes, conforming to the two size groups (pl. 74, *d*) noted in burial No. 2. Forty-seven complete and 3 fragmentary specimens ranged in diameter from 2.5 to 5.2 mm., and in length from 7 to 11 mm. Four other whole beads averaged 10 to 11 mm. in diameter by 22 to 26 mm. in length, and there were fragments of 2 or 3 additional specimens of about the same dimensions and proportions.

The awl, made of some unidentifiable mammal bone, was slightly curved, with rounded butt and a subcircular cross section. It was 58 mm. long, with a maximum diameter of 7 mm. Like all bone from the site, it had been deeply corroded by ground moisture (pl. 74, *c*).

Among the stone artifacts present, the projectile point and scrapers are of particular interest (pl. 74). The point, of gray chert, is shouldered, with a heavy stem expanding toward the straight base. It is 90 mm. long, 6 mm. thick, and has a maximum width across the shoulders of 24 mm. (fig. 87, *a*). The scrapers, seven in number, are

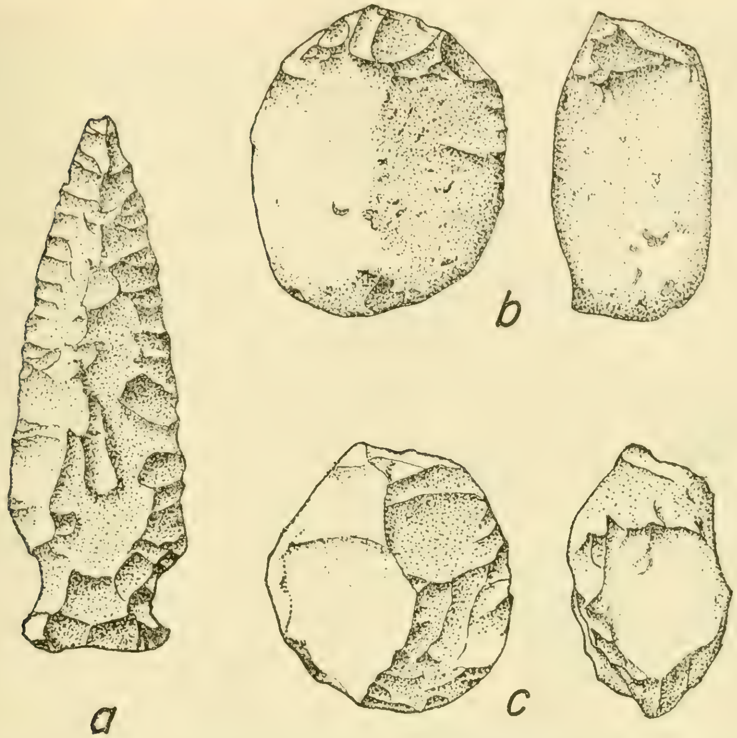

FIGURE 87.—Stemmed projectile point and split quartzite pebble scrapers from burial 3, Young site 14SC2. Actual size.

short, wide, and thick, planoconvex in cross section, with a high dorsal ridge (fig. 87 *b*, *c*). This description, of course, would apply to countless thousands of chipped scrapers from sites all over the Plains area, but the present specimens differ in at least two particulars: first, they are proportionately much shorter and thicker than the common Plains type, and secondly they seem to have been fashioned from small split pebbles or nodules with no subsequent modification other than a slight flaking at the thick work end. They probably would stand out as a distinct group in any collection of typical Plains end scrapers, though I suspect they were used in the same manner as the latter. The whole specimens show the following dimension ranges: 30 to 44 mm. long, 25 to 34 mm. wide, and 9 to 18 mm. thick. Of the four spalls from burial No. 3, one has finely retouched edges and may represent a knife or side scraper; the others suggest rejectage or unworked knife or scraper blanks.

The mussel shells from the grave, three in number, represent local fresh-water species, including *Ligumia subrostrata* (Say) and *Lampsilis anodontoides* (Lea).

*Burial No. 4.*—Twenty inches southeast of burial No. 1, at a depth of 18 inches, was a discolored area measuring 12 by 22 inches, with the long axis running southwest to northeast. There were only a few traces of bone in the grave, evidently that of another infant; the orientation and arrangement of the body could not be determined. Accompanying the interment were two broken fresh-water mussel shells, one possibly perforated, and both identified as *Uniomerus tetralasmus* (Say).

*Burial No. 5.*—About 5 feet southwest of burial No. 3, in line with the latter and No. 1, was the grave of an adult female. Much the deepest of the group, the skeleton lay on clean white sand 42 inches underground (pl. 75, *c*). The overlying grave fill included the following soil strata, from the top down: 4 inches of dark-gray humus; 12 inches of closely packed limestone fragments intermixed with sand and bits of charcoal; 6 inches of dark sandy soil; 8 inches of fine clean white sand; 6 inches of dark sand containing some charcoal; 4 to 6 inches of gray charcoal-mixed sand in which were the bones. The skeleton was closely flexed, lying on its left side with the head at the easterly end of the grave. The arms were folded so that the hands were together, forming a sort of pillow in front of, and partly under, the face. The legs were tightly flexed, with the feet against the buttocks and the knees toward the left within a few inches of the elbows. As in the case of burial No. 3, so here the bones were very soft; even with the application of a fixative, it was possible to salvage only the skull, some limb bones, and a few other specimens.

Three artifacts were taken from the grave. All lay in a tight cluster just below the left knee, against the shaft of the tibia. One was a chert drill (pl. 74, *b*), the shaft of which widened abruptly to a straight base; it was 45 mm. long, 18 mm. in maximum width, and the square shaft had a diameter of approximately 7 mm. A subelliptical or somewhat leaf-shaped knife of gray porphyry measured 74 by 35 by 12 mm. The third specimen was a fragment from the small end of a rude scraper made, like those found with burial No. 3, by splitting a quartzitic pebble or nodule.

*Other finds.*—During the general excavations in the burial area a few stray artifacts and occasional human teeth or bone fragments were turned up which could not be ascribed to any of the graves noted. Twelve inches west of burial No. 4, at 16 inches depth, was a small barbed arrowpoint, from which a stem had apparently been broken. Not far from burial No. 3, but probably not associated with it, were a triangular concave-base arrowpoint measuring 40 by 26 mm., and a gray quartzite end scraper. Between burials No. 2 and No. 5 were two rude side scrapers, of chalcedony and buff chert; a subtriangular chert blade 22 by 35 mm.; and an unfinished tubular bone bead 7 by 16 mm. Scattered about in the sand were numerous flakes of chert, quartzite, moss agate, plagioclase basalt, and other materials. There were no pottery fragments, though a thick vertical rimsherd, made of fine black paste containing coarse silicious inclusions, and bearing partially obliterated cord roughening, was found on the bench some 70 or 80 yards south of the burials. There is no proof, of course, that this sherd had any connection whatever with the individuals buried on the slope of the Knob.

Extended test trenches and pits elsewhere on the slope of Buzzards Knob yielded only negative evidence as regards additional graves, and it seems probable that the site has been exhausted. Concerning the graves graded out prior to our work, we learned no details beyond the statement by an eyewitness that they were stone-covered and contained no pottery. Generalizations regarding the site and inferences as to its significance in the prehistory of the locality must therefore be based on a lamentably small and incomplete set of data.

It seems safe to infer that burial in the flesh was practiced, since the bones of Nos. 3 and 5 certainly, and those of No. 1 probably, had been deposited in articulation and not secondarily as dismembered parts. None of the remains showed any evidence of exposure to cremation fires. In the case of the adults, at least, more or less complete flexion of the corpse was indicated. With the exception of No. 1, which had the head apparently at the south end, the graves seem to have been oriented with the long axis southwest to northeast and with the skull or skull fragments most commonly at the northeast end. There can be no doubt that interment was in dug pits; boulders placed in the upper part of the fill were apparently optional. If unworked, or doubtfully worked, mussel shells be included, mortuary offerings were present in all observed burials, though not in striking quantity.

The probable chronological position and cultural affiliations of the Young site burials are not readily apparent. Culturally diagnostic artifact associations are virtually absent, and this precludes allocation to known complexes of the region. It should be emphasized here, however, that neither the skeletal remains nor the accompanying artifacts suggest a direct connection between the burials and the people who lived in and about the pueblo. The stone artifacts from the graves, for example, including the large stemmed projectile point, the split pebble scrapers, and the drill, are markedly dissimilar to the analogous forms found at the stone ruin. The patinated and much corroded bone beads do not resemble as a group the characteristic forms from about the pueblo. The available crania in no way suggest puebloid types (see Stewart, p. 679). There is thus no reason, somatological or cultural, to ascribe the interments to a puebloan group, early or late, or to a nonpuebloan group of such recent date as to have been in contact with white men. On the contrary, they probably antedate the settlement of and about the pueblo by several or many centuries, and are to be correlated with a much earlier occupancy of the locality by a people with Woodland affinities. Whether they equate chronologically with such Middle Woodland complexes of the Central Plains as the Woodruff ossuary (Keith Focus) or Kansas City Hopewellian, or alternatively precede these and betoken an Early Woodland or older occupancy, I am not in position to say.

Our suspicion that the burials represented a horizon earlier than that manifested about the monument led to much surface hunting and test pitting of all likely village locations in the vicinity. Members of our party explored the extensive terraces on both banks of the creek below the dam, the tops and slopes of several mesas and other outliers, and the two larger tributary canyons—Timber and Bull—which enter the main valley from the west and east, respectively, above and opposite the burial site. Flint chips and bits of charcoal occurred in numerous spots in the topsoil, but nowhere was there sufficient concentration or other corroborative evidence to justify a large-scale excavation. Several shallow overhangs or rock shelters were found, occasionally with charred grass, wood, and similar material mixed with the sandy floor deposits, but as might be expected from their small size none showed satisfactory proof of human habitation. The artifacts collected during this surface work consisted principally of chipped stonework—end and side scrapers, crude knives, broken projectile points, miscellaneous spalls, and occasional fragments of large heavy cutting or chopping tools of pale yellow chert. The few sherds found were small and so badly weathered as to be of little comparative value. Several were calcite tempered, and may pertain to a Woodland occupancy much more strongly represented on Salt Creek, 13 miles east of the park; others suggest the sand-tempered Upper Republican ware also found to the east and north. Most of the finds, however, did not differ greatly from material found in the vicinity of the "El Cuartelejo" monument; there was nothing obviously and distinctively of very ancient type nor, conversely, did we find anything clearly attributable to known tribes of the historic period. The ubiquitous occurrence of worked flints, tools, and chips, even atop difficult buttes a half mile and more from water, does not suggest a settled occupancy. Rather it would appear that small parties of hunters camped briefly and carried on certain of their activities on every terrace, butte, and mesa, and in every canyon, in the vicinity. Of additional puebloan structures rumored to exist in and above the park we could learn nothing concrete. What may lie beneath the waters of the lake, particularly along the submerged bank of the former creek just above the dam, there is now no way of ascertaining, but it is quite probable that several terraces well suited to aboriginal habitation and possibly utilized by Woodland and other prehistoric groups have been flooded and thereby made inaccessible for investigation.

### SURFACE FINDS NEAR SHALLOW WATER, SCOTT COUNTY

In central and southern Scott County and northern Finney County is a sizable area of generally flat smooth land from which there is no surface drainage. Today the district is known as the "shallow-water basin" because water is generally obtainable at comparatively shallow depths by drilling. To primitive man, obviously, the ground water was useless; the important characteristic of the area was the presence of numerous shallow basins that in times of heavy precipitation were temporarily transformed into ponds and water holes. Several short intermittent creeks from the west terminate in this locality; the largest, Whitewoman Creek, ends in a large depression south of Scott City where its flood waters occasionally create a shallow lake of some size. The reports of local collectors, substantiated by a very limited surface reconnaissance on our part, indicate that at times in the past the "shallow-water" area was perhaps not so uninviting as the casual traveler in a dry summer today might suppose.

One of the best known spots hereabouts for hunting "relics" is Pony (or Pawnee?) Mound (14SC3), a natural eminence 6½ miles south and 4½ miles east of the town of Shallow Water, and about a mile north of the Scott-Finney County line. Immediately west of the mound are several dry depressions or playas. During the dust storms of the "dry thirties" as much as 12 inches of soil is said to have been stripped from the mound surface, thereby exposing fire-blackened hearth (?) areas and concentrating among them great quantities of animal bones, burned stones, chipped flints, spalls, and flakes, lesser numbers of potsherds, occasional large blades, and a few glass beads. At the south end of the mound is a depression some 15 or 18 yards in diameter, locally reputed to have been used as a "fort" by soldiers. A small test hole dug in the center revealed only a thin black line of silt, such as might have been deposited by wind in standing water, with clean reddish sand below; the origin and purpose of the basin, if man-made, are problematical. Other tests in the hearth (?) areas showed only a gradual thinning out of mixed and discolored earth, with no signs of disturbance by man below 12 inches depth or in the surrounding soil. Half a mile east of Pony Mound more burned spots and other remains were noted, but here also there was a notable absence of subsurface evidence. Other similar localities are known east of Shallow Water.

Our small artifact collection from Pony Mound is of interest primarily because of the variety of types suggested. Among the sherds, all of which are small and much weathered, there are half a dozen thick "hole-tempered" pieces with cord-roughened exteriors—undoubtedly a Woodland ware from which angular particles of calcite aplastic have been leached. More plentiful are thinner harder sherds, also cord roughened but with rounded gravel or sand inclusions, that are probably of Upper Republican origin. Reminiscent of pottery from the Blue River district of northeastern Kansas is a collared crisscross incised rimsherd with slate-gray core and thin buff-orange inner and outer surfaces, the latter cord roughened. Another small thin recurved rim, finely tempered with sand and containing mica particles, closely parallels sherds from the Dismal River middens at the Scott County pueblo ruin (14SC1). Projectile points include stem fragments of heavy corner-notched pieces, but small triangular notched and unnotched specimens are more common. Broken knives, scrapers, drills, and other materials are of less diagnostic value. The glass beads include small blue and white forms, as well as larger red ones with white core. No extremely old forms are represented in our material, though there are reports of Folsom or Folsom-like blades having been picked up in the district.

Inadequate as our sample is, it clearly attests the presence of a succession of peoples in the locality—none with established residence and all, no doubt, here to hunt game attracted to the transient water holes. If the several sherd types noted above are correctly identified, it may be inferred that Indians residing usually farther to the east made occasional or periodic excursions to this westerly locality; much of the stonework may have been left by nonpottery groups who since time immemorial roamed the western Plains to gain the major part of their livelihood from the bison. The shallow-water basin was, in short, a hunting area, and gives little or no promise of revealing, in situ, stratified camp or village sequences such as may be expected in the better watered creek valleys to the north and east.

## ABORIGINAL CHERT QUARRIES

### COWLEY COUNTY QUARRIES

So far as I have been able to learn, the only quarries in Kansas that can be certainly attributed to aboriginal chert gatherers, are in the Flint Hills upland. The largest and best developed are in southern Cowley County, near Maple City (14CO5). Here, and southward into Kay County, Okla., are extensive outcrops of a thick-bedded Permian limestone interbedded with nodular chert. The nodules range in thickness up to 6 or 8 inches. Freshly broken faces have a bluish-gray color, but on weathering this becomes tan, reddish, or rusty brown. Some of the nodules show a characteristic banded structure that on a fractured surface gives a very pleasing effect comparable to the grain in a fine piece of cabinet wood. The chert, moreover, though tough and serviceable, is tractable and easily worked. That it was highly esteemed by the Indians is attested by the finding of artifacts made of this material in Rice County, more than 120 miles northwest of Maple City.

A brief examination of the Maple City quarries was made in company of Bert Moore, on August 8, 1940. Immediately southwest of the town, along the edge of a grassy hill overlooking a small intermittent headwater tributary of Little Beaver Creek, were numerous shallow partially filled-in depressions. They were irregular in outline, from 6 to 10 feet wide, 10 to 60 feet long, and from a few inches to nearly 2 feet in depth. Scattered about the depressions were limestone boulders and quantities of whole and broken chert nodules. Most of the latter were banded, of dun, gray, or brown color, and many contained an abundance of *Fusulina* fossils. We found no rejects or quarry blanks, but were told that many had been gathered up in past years. Six or seven nodule fragments were collected from about the depressions, and a nearby resident, W. H. Uteley, presented us with two additional specimens picked up on the site. One of these is a large shaped elliptical blank 16.5 by 10 by 3 cm. in size.

Our chert samples from Maple City, together with nine representative chipped artifacts excavated from Indian mounds in Cowley and Rice Counties, were submitted to L. G. Henbest, United States Geological Survey, for examination. Mr. Henbest reports that the two Uteley samples contain "a few specimens of *Paraschwagerina kansasensis* (Beede and Knicker). This is characteristic of the Florence flint but may not be restricted to that horizon." Some of the nodule fragments picked up by myself "contain *Paraschwagerina* aff. *kansasensis?* (Beede and Knicker), and one or two other species of Lower Permian fusulinids that, as exposed, are difficult to identify, whether *Schwagerina*, *Paraschwagerina*, or *Pseudoschwagerina*." As for the artifacts, specimens from both counties—

> contain an assemblage that resembles that in 493 [my quarry samples] in several details. On the basis of a superficial study I would say that they are the same. Although the range of the *Paraschwagerina* aff. *kansasensis* (Beede and Knicker) and the other Lower Permian *Schwagerininae* in this collection may possibly begin in the Neva and extend to the Florence, they may safely be regarded as Florence.

It should be noted that the artifacts examined included specimens of unbanded as well as of banded chert, this particular feature lacking the diagnostic value which the enclosed fossils have.

I know of no systematic explorations in any of the quarry pits in Cowley County or in those farther south. It may be of some interest to note the observations made by Gould (1898 a, pp. 78–79; 1899) even though these relate primarily to the workings in Oklahoma. In his first report (1898 a, pp. 78–79) he states that—

> About 3 miles south of the territory line and 8 miles south of Maple City, Kansas, are situated several hills on which are located what are known locally as "The Timbered Mounds." They are situated some half mile east of the junction of Myers Creek and Little Beaver.
>
> The hills in all the region consist of massive ledges of limestone, containing much flint and alternating strata of gray and drab shale. Near the base of the hill the prominent ledge on both sides of the creek is the Strong flint of Prosser, beneath which is a ledge of massive sandstone. The ledge capping the hills is the Fort Riley or Florence flint. It is on the last-named ledge that the "Mounds" are located.
>
> . . . On a crescent-shaped ridge about a half a mile long and from 50 to 150 feet wide the hard but brittle limestone has been quarried in great quantities, and has apparently been piled up in the form of rude edifices. . . . The stones which compose these buildings seem to have been broken out of the ledge at intervals and without regularity of size. In shape they are flat, not more than 6 inches thick, and usually longer than broad. There are none that a strong man cannot lift.
>
> In certain areas of perhaps half an acre the loose rocks cover the ground to a depth of three to four feet. . . .
>
> The edifices which have fallen down appear to have been either square or circular, with a ground diameter of 5 to 15 feet. In several places can be noticed the faint outlines of structure, but usually the rocks are piled in shapeless heaps. One peculiarity is that so far as noticed all the buildings seem to have fallen toward the center as though they had sloped inward like an Esquimaux hut. Occasionally there will be a space in the center not covered with rock as if the wall was not high enough to reach the center when it fell. . . .
>
> No marks of tools have been discovered on the rocks; but in some places there are traces of fire. . . . Besides the hill described there are at least four others, within a radius of three miles, covered with the same kind of ruins, and other hills with traces of the same peculiarities have been found in the state near Maple City.

To S. W. Williston is credited the suggestion finally accepted by Gould that—

> The ruins mark the sites of ancient flint quarries. The ledge on the top of the hill contains many flint nodules, sometimes nearly as large as a man's head, and among the loose rock these nodules are conspicuous for their absence, although many flakes of flint as large as one's hand may be found. This ledge is the farthest west of any flint-bearing ledge in the region; and probably the plains tribes from the west obtained their arrowheads and flint implements from this locality. This is further substantiated by the fact that the flint implements found in the prehistoric mounds at Arkansas City, some 20 miles northwest, contain fossil *Fusulina cylindrica*, which are characteristic of the flint mentioned. The edifices described above were probably temporary structures used by the workmen while engaged in quarrying.

A second note in the year following (Gould, 1899, p. 282) records the fact that—

> . . . more than 100 imperfect implements, or rejects, have been found. They vary in size from 3 to 8 inches in length, and from 1½ to 4 inches in breadth, and weigh from 3 ounces to 1½ pounds. In shape they are usually oval and twice as long as broad, ends roundish or pointed, with usually a cutting edge chipped on all sides. They are nearly always broken. . . . One or two specimens are nearly perfect. . . .
>
> . . . The first locality is south of Myers creek and east of Little Beaver, in the Kaw reservation from 6 to 12 miles nearly south of Maple City, Kansas. It is here the quarries were first studied, and here most of the excavations seem to have been made; but singularly enough very few rejects have been found here. The second locality is in and around Maple City. Most of the rejects have been found on the farms of Mr. H. Ferguson and Mrs. George Sutton. Some interesting localities are found 3 to 5 miles north of Maple City.

On our hurried visit to the "Timbered Mounds" no evidences of structures were noted; undoubtedly the remains so termed by Gould are nothing more than piles of stone heaped up by the Indians in their search for suitable chert. The workings are much more intensive than those near Maple City—the pits are larger and deeper, up to 30 feet across, and as much as 3 or 4 feet deep. In and about the pits are large heaps of limestone, among which we found surprisingly few chert fragments. A road cut just west of the quarries revealed a layer of nodular chert 2 to 3 feet underground, and overlain by limestone. This, I suspect, was the stratum sought by the Indian workmen. In what little chert we found among the diggings, very few pieces showed the banding so typical of many of the Rice and Cowley County artifacts, and almost none of our samples contained *Fusulina* fossils. Gould's correlation of the "Timbered Hills" chert with Arkansas City mound artifacts, on the ground that both contained fossil *Fusulina cylindrica* was probably based on accurate observation but in light of subsequent terminological revisions it is outdated and nomenclatorially inaccurate. The species *F. cylindrica*, or its closest relatives in America, characterize the upper part of the Des Moines Series in the Middle Pennsylvanian, whereas the horizon represented in the Kay County quarries is lower Permian. The nearest possible source of relatives of *F. cylindrica* is 70 to 75 miles east of Maple City and Hardy.

From the quantities of debris seen at these quarries, it must be inferred that they were once quite extensively worked. At what period this activity began, by whom it was carried on, and when it finally ended, are intriguing questions for which I have as yet only partial answers. My excavations and observations since 1930 in various sections of the Nebraska-Kansas-western Missouri region suggest that artifacts and rejectage probably traceable to these quarries occur in greatest abundance in the protohistoric sites in Rice, Cowley, and nearby counties along the Arkansas in central and south-central Kansas. Elsewhere, I have seen or collected specimens from the Fanning and Doniphan sites, in Doniphan County, and from sites near Neodesha, Marion, Salina, and Pratt. The Salina and Pratt sites, briefly described elsewhere in this paper, are pre-White contact, probably 15th century or earlier; all the others have yielded White contact material. The blue-gray chert characteristically found in sites about Manhattan and elsewhere in the Kansas River drainage, especially in the prehistoric sites, is apparently of about the same geological period as the foraminiferous chert from Maple City, but presumably is of local origin.

It may be suggested tentatively, then, that so far as semisedentary horticultural groups in the Central Plains are concerned, the Maple City material was used principally during the 16th, 17th, and early 18th centuries, especially by peoples in central and southern Kansas; that it was probably used in limited quantities as early as the 15th century, and possibly before; and that in small quantities it was traded or carried as far as the Fanning site. I have no information regarding either absence or presence of the material south of certain early historic Kay County sites in Oklahoma, or to the east or west. Possibly some of the quarrying was done by nomadic hunting peoples whose traces still elude the archeologist. Perhaps, too, publication of full data on more southerly sites will shed further light on this matter.

### CHASE COUNTY QUARRIES

Much less conspicuous than the Maple City-Hardy quarries are other workings in central Chase County, some 90 miles almost due north of the previously described operations. They are situated on a lofty tableland locally known as "Flattop," approximately 4 miles south of Elmdale and 2 miles southeast of the Cottonwood River. Here there are traces of two small areas of ancient diggings, some six or seven hundred yards apart. Both lie just within the south edge of section 11, T20S, R7E.

The westernmost of these two areas (14CS2) lies at the immediate edge of the tableland, overlooking a long westward slope in which the ground falls some three hundred feet to the Cottonwood valley. Here there is a thin soil cover over a limestone caprock. In this soil cover may be discerned faint evidences of old disturbances. These are shallow irregular grass-grown depressions not exceeding 12 inches in depth and up to 10 or 12 feet wide. At one point, these depressions form a sort of horseshoe opening to the west, that is, at the edge of the tableland where the soil covering the cap stone would have been thinnest or absent. Inside this horseshoe a slight elevation may be recognized, and this suggests detritus cleared from the pits and piled in an area that had probably already been stripped. The entire situation looks like the result of shallow digging, pushed from the edge of the table eastward. Chert fragments, often fractured and sometimes clearly shaped into elliptical quarry blanks, are scattered over the grassy surface of the disturbed area. To the south, there appear to be other smaller workings, similarly marked by shallow irregular depressions in the grassy terrain, and littered with fractured chert. Here and there may also be seen large limestone blocks and fragments, most of them partly buried in the sod.

The eastern area (14CS3) lies on the slope of a dry swale draining southward into a small tributary of Rock Creek. Here again there is a thin earth mantle overlying ledges of massive white limestone. The diggings here seem to be linear, as though the workmen were following some specific ledge or vein; and they tend to run at right angles to the slope of the land. Numerous large blocks of limestone have been turned up, and among them, scattered all over the diggings, are numerous fragments of chert, mostly cores and fractured blocks, but occasionally with shaped quarry blanks. At one point, in the dirt thrown out by a large burrowing animal, many small chips from the primary flaking of quarry blanks were found. For the most part, the chert found here, as in the western diggings, was whitish-gray rather than the blue-gray material so characteristic of chipped artifacts from village and campsites in and adjacent to the Flint Hills.

Since my only visit to these quarries was made during a vacation period, no excavation was possible, and so I am unable to describe the subsurface character of the pits. They are shallower, smaller, and much better grassed-over than are those in the Maple City-Hardy locale, and give an impression of being considerably older. That they actually represent aboriginal quarries cannot be proved at the moment; but no other satisfactory explanation comes to mind. Local residents insist that they are not a result of early explorations for limestone for building or fencing purposes, nor are they in the sort of location where road materials would be sought. The presence of shaped quarry blanks, similar to those encountered on Indian sites in the region, and the manner of occurrence of the chert—as nodules in limestone ledges—seem like strong arguments in favor of aboriginal quarrying operations. There are no village or campsites within several miles, nor are there any farmsteads in the immediate vicinity.

That similar workings occur elsewhere in the Flint Hills region is very probable. The chert nodules occur at several levels throughout the limestone of which the Hills are mainly composed, and wherever the ledges have been exposed by valley erosion, the chert was made accessible to native man with the expenditure of little effort. Since much of the Flint Hills region is primarily grazing, and since workings such as those described in Chase County are relatively inconspicuous to any but the closest scrutiny, it is entirely likely that a number of similar features still await discovery and reporting.

## PETROGLYPHS

The surface geology of Kansas is not conducive, for the most part, to the high development of pictorial art on stone, or to the long preservation of such art as may once have existed. Over much the greater part of the State there are no ledges, boulders, or other smooth-surfaced outcrops of stone suitable for the delineation of designs by pecking, grinding, or rubbing; and many of the exposures that may well have invited the aboriginal artists to try their hands, consist of soft stone with little resistance to weathering by wind-borne dust and sand, by rain, and by frost. It is possible, of course, that a determined and sustained effort to locate rock carvings would reveal many more occurrences than are recorded here, though I doubt that many groups of any size or complexity have escaped detection. The occurrences briefly noted in the following pages are necessarily incomplete, since they represent sample data gathered more or less incidentally in course of village site explorations and are not the fruits of an intensive search directed primarily at petroglyphs.

With two observed exceptions, and one or two others briefly recorded in the literature, petroglyphs appear to be pretty much restricted to a small area in the central part of the State north of the Arkansas River. Here their occurrence is correlated with the presence of scattered outcrops of Dakota sandstone, a friable brown to reddish-brown material whose vertically exposed faces offered an easily worked surface. Outside the Dakota sandstone belt, in the soft shaly and calcareous formations to the west and in the limestones to the east, petroglyphs are apparently very scarce and inconspicuous.

So far as my information goes, all Kansas petroglyphs are carved into the rock surface. Presumably the designs were first lightly outlined by scratching and the desired lines were then deepened and widened by grinding or rubbing with a thin-edged stone tool. In the relatively soft sandstone of the region, even the most involved figures could be made in a relatively short time by this process. I recall no petroglyph that could not have been made thus. We saw and heard of no paintings, nor would I expect that designs in color had they ever been made would have lasted more than a few years in any of the locations we examined.

It may be stated at the outset that there is no way of dating accurately the petroglyphs recorded below, or of determining by what tribes or for what purposes they were made. Representations of the horse, or of mounted riders, occur in a few places, and these obviously date from a time after the introduction of that animal, i. e., within the last two or three centuries. For the great majority of the figures, however, there is no such fixed maximum date line, and such criteria as the degree of weathering, relative crudeness, or superposition of one design over an older are manifestly unreliable. It is a safe guess that not all the figures were made at one time or by the same tribe or cultural group. Unhappily, in no case do the rock designs resemble those on known pottery types or other native remains, and there is not the slightest bit of evidence linking any of the carvings with any of the archeological horizons of the area.

As to the motives that prompted the carvings we can only speculate. Life forms, both animal and human, unreal creatures of various kinds, and a variety of simple geometric and rectilinear designs occur. Some of the latter may have been purposeless scratchings. Some of the unrealistic creatures may have had ceremonial or religious significance, and for this or some other reason were inscribed on rock walls near springs or watercourses. Horses and horsemen, and perhaps the linked human figures, may have been memorials or reminders of some otherwise unrecorded event. Occasional simple figures occur in such obscure and solitary places that one wonders if they might have been made by lonely youths seeking a vision, or perhaps by members of a hunting or raiding party temporarily immobilized as by proximity of an enemy or other menace, real or imaginary.

In the following pages I have listed and briefly described the petroglyph sites for which I have direct, or reliable indirect, evidence. With exception of the first, to which access was denied by the owner, I have visited all of the localities personally and obtained sketches, photographs, or both, of the drawings.

*Site No. 1. Smoky Hill River, Ellsworth County* (*14EW1*).—This is probably the outstanding petroglyph site in Kansas, as it is also one of the very few that has found its way into the literature. Under the designation "Inscription Rock," it was briefly noted, and part of the carvings illustrated, by Miller (1869, p. 383 and pls. VII and VIII). Mallery (1893, p. 80 and fig. 44) reproduced tracings from Miller's drawings but on a greatly reduced scale. Though I was not able to investigate the spot myself, G. L. Whiteford of Salina has generously supplied me with 18 photographs showing outstanding portions of the gallery. From these photographs I have traced a number of the petroglyphs, not, however, to scale or in their correct position relative to each other (fig. 88).

The locality is on the left bank of Smoky Hill River approximately 15 miles southeast of the city of Ellsworth. I have been informed by William O. Leuty, United States Engineers Department (letters of March 10 and 19, 1942, and accompanying map) that village sites

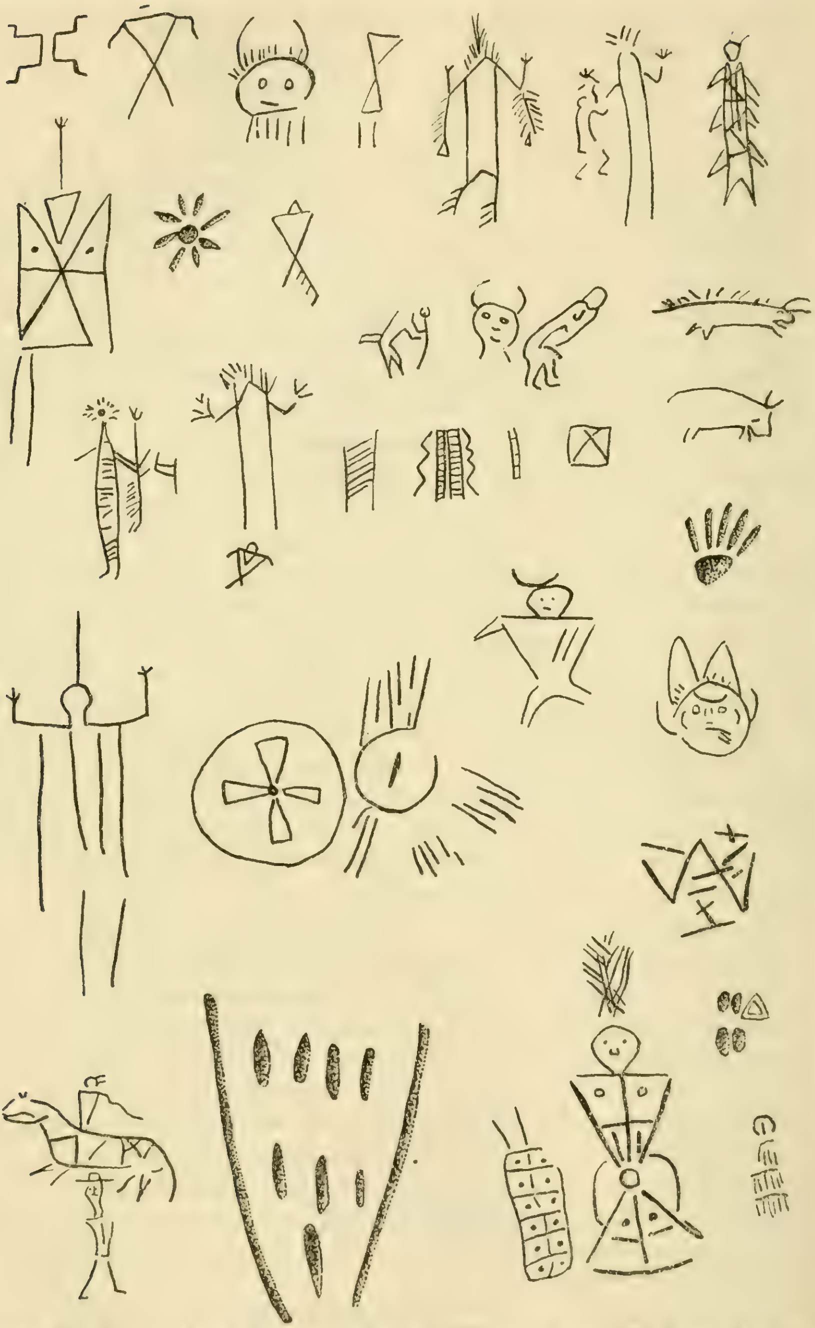

FIGURE 88.—Petroglyphs at Inscription Rock, 14EW1, on Smoky Hill River, 15 miles southeast of Ellsworth. (Not to scale or in correct relative position.)

and rock cairns occur at a number of points along this portion of the Smoky Hill, but their age and cultural affiliations, as also their relationship, if any, to the petroglyphs, remain unknown (see also Smith, 1949 a, p. 293).

The "Inscription Rock" or "Indian Hill" petroglyphs include a wide range of figures, in all stages of preservation and unquestionably of varied authorship. There is, of course, the usual profusion of recent dates, names, and initials left by picnic parties, sightseers, and others. Five-pointed stars, an American flag, certain tentlike and boatlike designs, a human figure wearing a wide-brimmed flat-crowned hat, an occasional horse, perhaps a Maltese cross in a circle, and a few other carvings are probably or possibly non-Indian, though they may date from well back in the last century. The great majority of the petroglyphs, however, are undoubtedly Indian, even though many are so deeply marked, so fresh looking, or otherwise so out of the ordinary that one suspects modern faking or retouching.

Human and animal representations occur in profusion. The former vary greatly in size and style; there are triangular, rectangular, and hourglass-shaped bodies, most of which give no details regarding dress or ornamentation. Heads are commonly outlined, with facial features shown, and have a pair of curved bisonlike horns or other appendages, perhaps representing a dance headdress; or they may be nothing more than a small drilled pit surrounded by short rays. Some of the figures have plumelike designs pendent at the elbow from partly outspread arms. One or two seem to be carrying a lance or ceremonial staff, but there are few representations of the bow and arrow or of other recognizable weapons. Animals include chiefly quadrupeds, apparently, but identification is not easy. There is an Indian mounted on horseback, with headdress trailing behind, and one or two figures suggest grazing cattle or bison. What may be an elk or deer with upraised head is also shown. Birds, serpents, water animals, insects, and imaginary monsters seem to be almost absent from the panels shown in my photographs (pl. 76, 77, *a*).

Geometric figures, though probably plentiful, cannot be easily distinguished in my views. There are several ladderlike designs, some single, others double and flanked with zigzag lines; squares containing an X; concentric triangles; circles or small drilled pits with radiating lines; multicelled oblongs with a pit in each cell; "deer-track" symbols, consisting of two elliptical hollows separated by a narrow vertical ridge; vertically bisected circles; bird tracks; and miscellaneous other patterns. No doubt a painstaking examination of the bluff face under varying conditions of light would reveal many additional figures, both geometrical and otherwise.

The very crowded nature of much of the petroglyph surface and the frequent superimposing of one figure over another is sufficient evidence that different periods of time are represented. In places, much of the carved surface has been dimmed by weathering, but whether this is correlated with greater relative age or is due to a more exposed location I cannot say. It is to be hoped that a more extended examination of the site can be undertaken before its scientific worth has been destroyed by time and man.

*Site No. 2. Elm Creek, Ellsworth County (14EW14).*—Two weathered petroglyphs were seen on the west side of Elm Creek 2½ miles due south of Carneiro. They are on an east-facing sandstone ledge perhaps 30 feet above the stream, which carries a small but steady flow of clear water, and is fringed with burr oak, ash, walnut, elderberries, gooseberries, chokecherries, etc. On the flats across the creek there are said to be circular depressions possibly representing pit-house ruins. The valley would offer unexcelled opportunities for camping in concealment by hunting or raiding parties, and may well have had a permanent village. The petroglyphs are anthropomorphic (fig. 89, *c*, *d*); each has the arms upraised, and one wears a horn at the side of the head. They are 8 or 10 feet apart. Nearby may be found a few rectilinear scratches, but the origin is uncertain.

*Site No. 3. Cave Hollow farm, Ellsworth County.*—This is a locally popular picnic spot about 4½ miles north by east of Carneiro, in Section 29, T14S, R6W. A steep-sided sandstone promontory on the north side of a small creek valley is pierced near its terminus by a curving tunnel about 15 yards long that opens at each end onto the creek valley. At the base of the promontory, perhaps 25 feet below the tunnel, the creek forms a small pond, augmented by a large seep just below the level of the tunnel and between its openings. The openings face south and southwest. On the ceiling and about the entrances are a number of petroglyphs. Recent vandalism and exfoliation of the stone has obscured or destroyed many others.

A few of the less extensively damaged carvings from the tunnel ceiling are shown in figure 89. They include a representation of a horse carrying an unidentified object on its back, several anthropomorphic figures, tridents, or bird tracks, and vestigial zigzag lines in opposed pairs.

On the south-facing wall between the tunnel openings and above the seep are traces of other more elaborate carvings. They are badly weathered and exceedingly difficult to reconstruct accurately. The principal figure appears to be a monster several feet long with broad oval head from which two parallel lines run zigzag along its back. Within the zigzag lines are triangular elements; below, are closely set slanting lines. No feet or legs are discernible in the photographs I

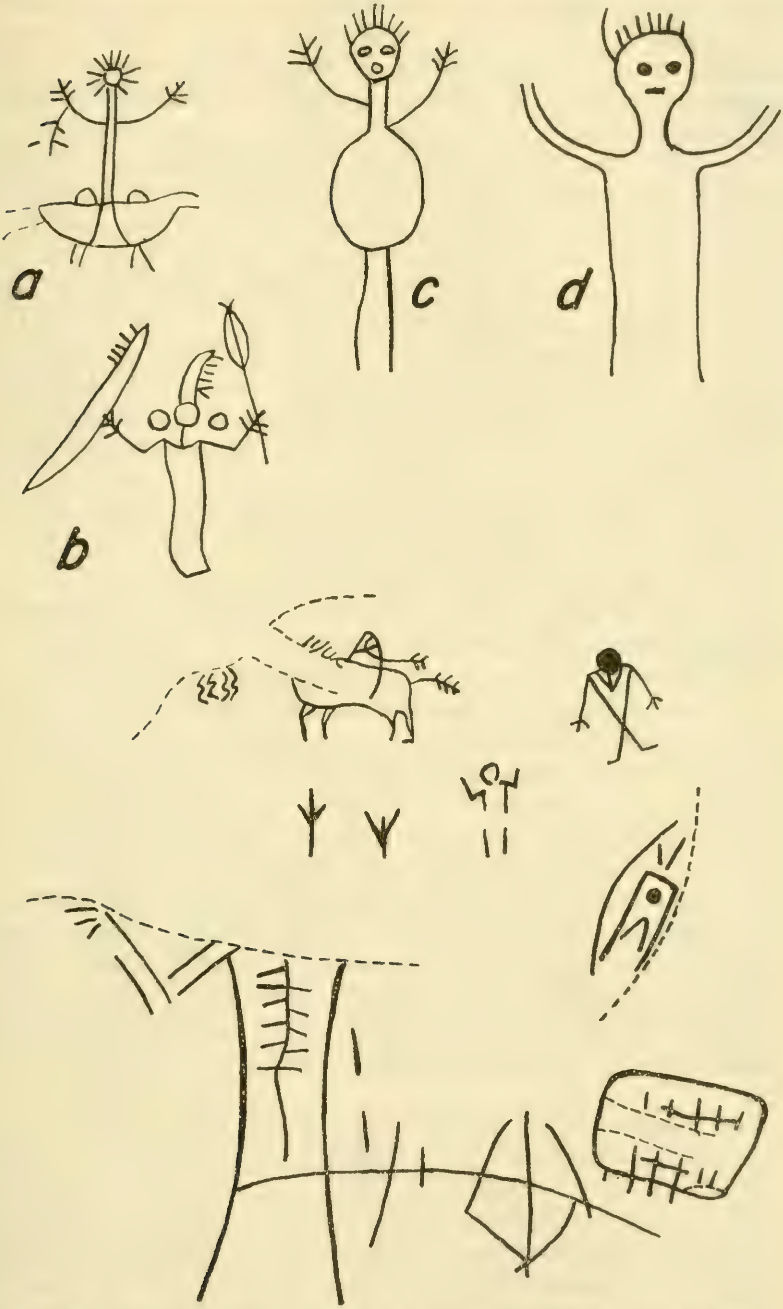

FIGURE 89.—Petroglyphs from localities 2 (*c*, *d*), 3 (Cave Hollow Farm), 4 (*a*, *b*), Ellsworth County.

have, and the creature cannot be entirely disentangled from several other smaller and possibly later zoomorphic figures. Nearby is a figure about 3 feet high consisting of vertical lines crossed by short horizontal lines in ladder fashion. Bird tracks and vertically bisected circles may also be seen.

*Site No. 4. Ash Creek, Ellsworth County.*—Eight miles south of Ellsworth and 7 miles north of the Rice County line State Highway 14 crosses a small dry canyon draining eastward into Ash Creek. Ledges of soft yellow-brown sandstone outcrop here and there throughout the canyon, but only a few were explored. One, about 200 yards west of the highway (NE¼, Section 33, T16S, R8W) and with a southerly exposure, has several much weathered petroglyphs of some antiquity, as well as others that have been recently deepened or otherwise retouched. One figure (fig. 89, *a*) is apparently that of an Indian standing upright on a saddled horse; the arms are spread, and from one hangs a plume or feathered object. Another individual (fig. 89, *b*) wears a tall feathered headdress, has a bow in one hand and an arrow or stafflike object in the other, and a circle at each side of the head. The figures are 8 to 10 inches (20–25 cm.) high.

*Site No. 5. Spriggs Rocks, Rice County (14RC1).*—This interesting group is in a small north-facing spring cove in the SW¼, NW¼, S13, T19S, R7W, 2 miles west of Little River and about 200 yards south of an artificial lake on a short unnamed tributary of the Little Arkansas River. The cove consists of a semicircular sandstone ledge perhaps 20 yards across by 20 feet high, from beneath which issues a moderate seep of water. Several large blocks have fallen from the ledge in recent years, and I was informed by G. L. Whiteford, who first showed me the spot, that many of the best petroglyphs are on what is now the underside of one of these boulders. The most interesting carvings now are on the east wall, many of them at heights somewhat greater than a standing person can reach. A very tenacious film of lichens, and the inevitable profusion of recent visitors' names, dates, and "doodlings" obscure much of the native art. The group deserves more extended study than we were able to give it (pls. 78, *a*, 79).

Anthropomorphic figures from 7 to 68 cm. high, most or all with rectangular bodies, are rather common (fig. 90). The bodies are generally bisected by a vertical midline, on each side of which are closely spaced horizontal or slanting lines somewhat reminiscent of the elaborate tubular breast ornaments of the historic Plains tribes. The limbs and necks are thin single-line affairs; heads are either small open circles or shallow circular pits, with or without short rays or treelike (feathered?) headdresses. A row of narrow-bodied humans with outspread arms, some of them carrying stafflike objects, may

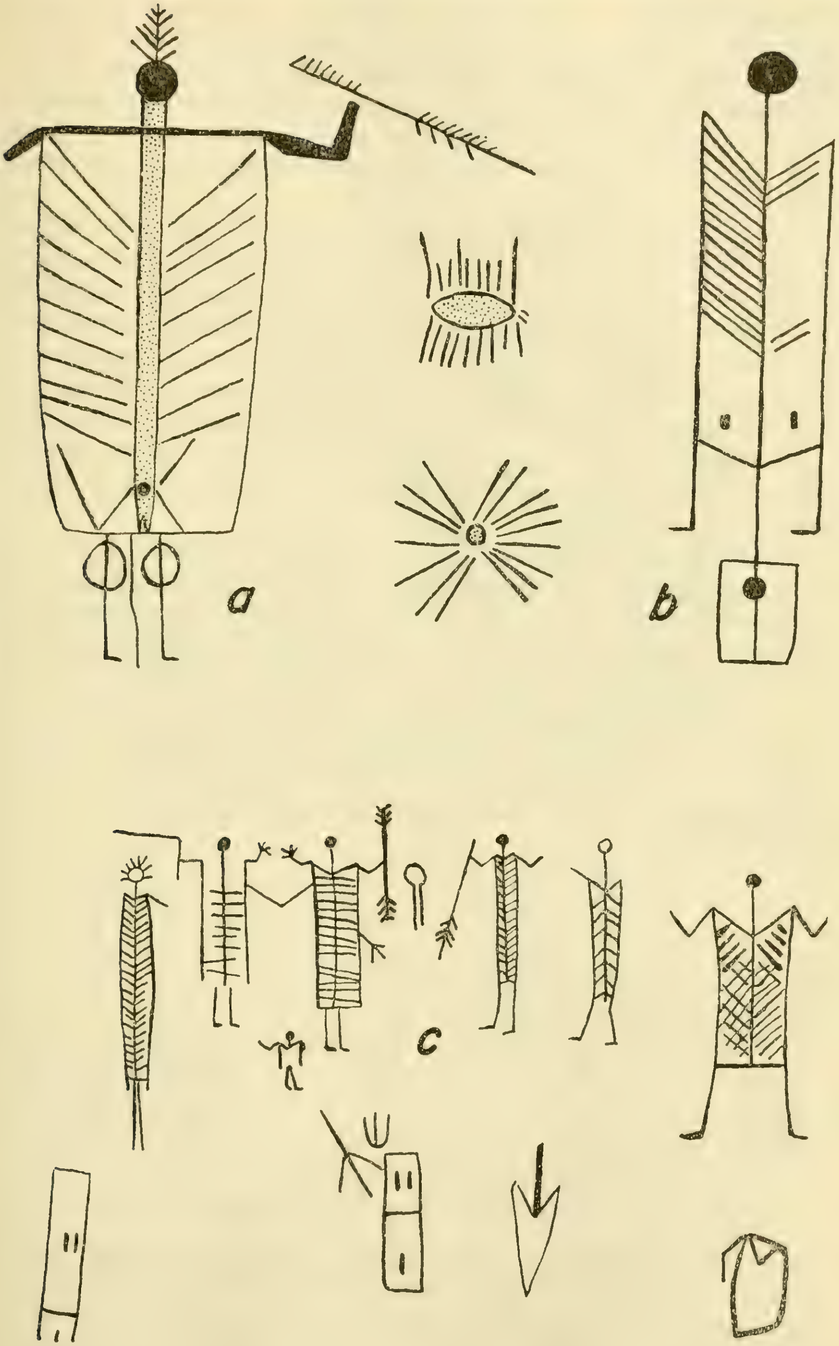

FIGURE 90.—Petroglyphs at Spriggs Rocks, 14RC1, near Little River.

represent dancers or celebrants (fig. 90, *c*); and one of two large figures has a circle superimposed on the upper part of each leg that might represent a tortoise-shell rattle (fig. 90, *a*). One obscure limbless and headless torso has a triangle pendent from the shoulder line, reminiscent of the biblike front of a buckskin shirt or dress. None of my photographs shows mounted figures, horses, or other quadrupeds.

Geometric designs include a small long-rayed disk with hollow center (cf. Site No. 1, supra); a biconvex or lens-shaped element with vertical lines above and below; numerous small rectangles containing two short vertical marks, either at the center or near the lower end; two short horizontal rows of contiguous circles, one row about 15 cm. above the other, with vertical lines connecting each circle in one row with the corresponding one in the other; and trident, bird-track, and miscellaneous other designs. There are indications of older anthropomorphic and other figures that have been obscured and mutilated by those now clearly marked.

*Site No. 6. Peverley farm, Rice County (14RC10).*—Three and a half miles northwest of the preceding and about half a mile south of the "council-circle" on the Hayes site (p. 321) is a north-facing tree-sheltered sandstone bluff with a spring at its base. Drainage is east and north by way of a normally dry branch to the Little Arkansas. Various simple petroglyphs, most of them apparently geometric, are scattered sparingly over the bluff face. Anthropomorphic figures like those at Spriggs Rocks and elsewhere seem to be absent. Most of the readily decipherable petroglyphs we saw are shown in figure 91 (pl. 77, *b*).

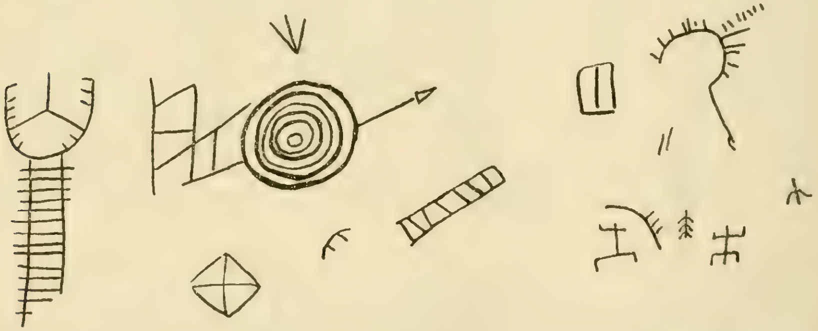

FIGURE 91.—Petroglyphs from locality No. 6, Peverley farm, 14RC10.

*Site No. 7. Near Galt, Rice County (14RC11).*—About half a mile east of Site 6, in the NW4 Sec. 35, T18S, R7W, is another small sandstone ledge on a dry creek. It faces west, is about 15 or 20 feet high, and has several seeps at its base. The spot has a few trees and could have served as a watering place for small parties of Indians.

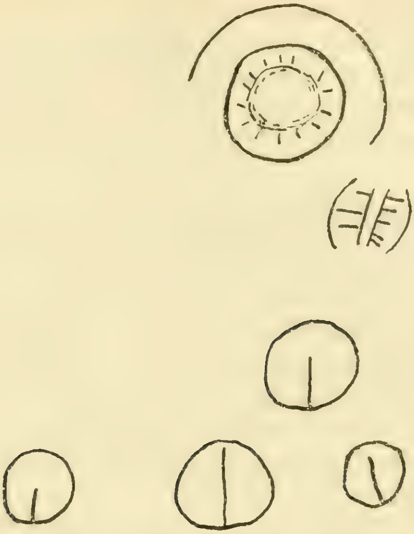

FIGURE 92.—Petroglyphs from locality No. 7, near Galt, 14RC11.

Above the main seep are a few inconspicuous petroglyphs (fig. 92). The principal one now visible has a central cavity about 10 cm. across by 3 or 4 cm. deep, encircled by a line about 3 cm. distant. Between the hole and the encircling line is a rounded ridge, with short radial lines running up out of the cavity. There are traces of a second incomplete encircling line. Just below and to one side are faint evidences of a circular or oval design, vertically bisected by two lines, with each part of the circle filled in with parallel horizontal lines. There are a number of simple circles, each with a vertical line running partly or entirely across it. The direction of exposure is an unfavorable one, and it is quite possible that a number of other figures have been obliterated by weathering (pl. 77, *c*).

*Site No. 8. Near Minneapolis, Ottawa County (14OT4).*—This rather unusual group is on a northeast-facing sandstone bluff about 6 miles southeast of Minneapolis, in the SE¼ Sec. 33, R3W, T11S, and about 3½ miles southeast of the village site designated Minneapolis 1 (Wedel, 1935). A swale fronts the bluff, suggesting an abandoned channel of the Solomon River, now some hundreds of yards distant. The bluff is screened by trees, and at its base is a sandy accumulation whose upper portions cover parts of some of the carvings. I know of no village site in the immediate vicinity, though it must be admitted that no very thorough search for one has yet been made.

The most striking figures on the cliff, apparently representing mythological creatures or monsters, cover a more or less continuous panel perhaps 25 feet long by 6 or 8 feet high. They are quadrupeds;

three have antlered or plumed heads, and all have a row of triangular plates or slanting lines running down the back. Body areas are filled in with closely spaced parallel lines, triangles, and crosshatching; one has a row of circles on the back. The only remotely comparable figure I recall from the general area is the large one dimly visible at Site 3.

There are also a number of small simple human figures, some of uncertain authenticity; tipi and pennantlike designs, etc.

*Site 9. Near Arkansas City, Cowley County* (*14CO4*).—On the Hall farm immediately west of the Arkansas City Country Club village site, on low ground between the bluffs and the Walnut River, is another unusual group of petroglyphs. They are on the flat upper surfaces of limestone boulders and ledges near a good spring. Here are to be found scores of shallow hemispherical pits from 25 to 55 mm. in diameter and about half as deep. Some are the heads of simple "stick" figures, i. e., single-line human representations, with uplifted arms and spread feet; others are connected with each other by broad shallow lines, or have a straight line running out 15 to 45 cm. to end in a Y or a three-pronged bird track. One pit is encircled by a line opening toward the east through two parallel lines. The majority of the pits, however, have no appendages, and do not appear to be parts of larger figures or configurations. The entire group is shown in figure 93, copied from a diagram furnished me by Louis Essex of Arkansas City. I know of no similar group in the State, and can offer no suggestion regarding their age or possible relationship to the nearby Country Club mound group.

*Site 10. Near Liberty, Montgomery County* (*14MY1*).—This group is located about a mile or slightly more east of Liberty, on a lofty hilltop outcrop overlooking Big Hill Creek and the Verdigris valley to the west. There are two or possibly three war-bonneted horseback riders, a number of small bored holes that tend to occur in pairs, paired elliptical hollows suggesting deer tracks, etc. My very brief inspection of this site was made late in the afternoon when the lighting was not altogether favorable. There has been considerable weathering but the designs were carved unusually deep and so retain their outlines fairly well. The mounted figures, of course, are fairly recent, but some of the others may be considerably older (pl. 77, *d*).

By way of augmenting our rather meager findings and on the possibility that some future investigator may be stimulated to more extended field studies, it may be well to enumerate some of the scattered previous records of petroglyphs in Kansas. Unfortunately, little more than enumeration is possible, owing to their extreme brevity. As with 8 of the foregoing 10 localities, most of these earlier records also pertain to the north-central part of the State. They contain little in-

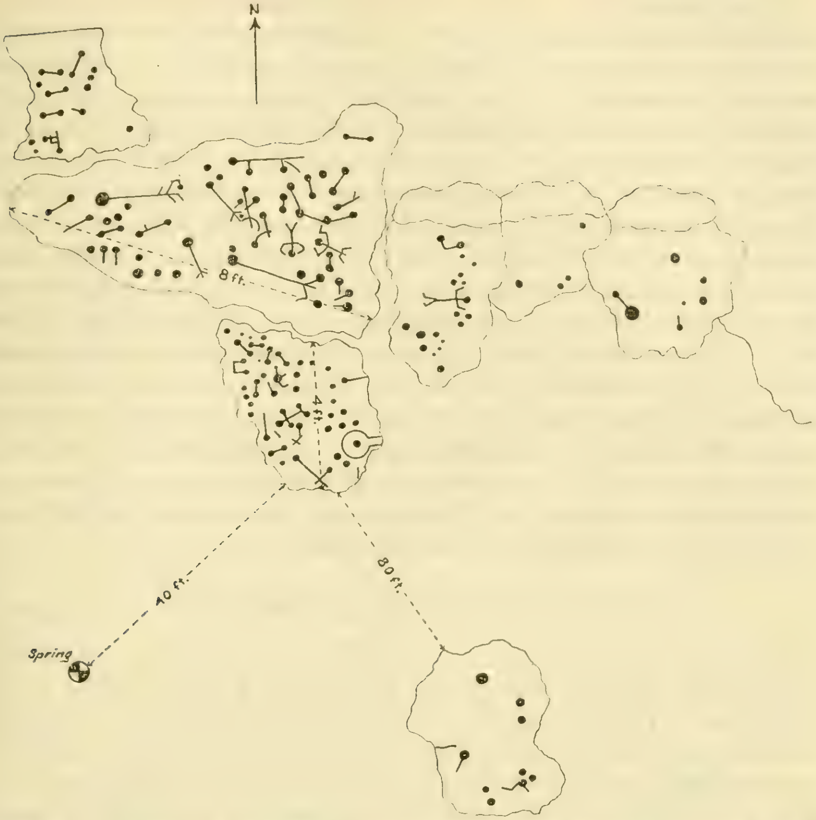

FIGURE 93.—Pit-and-line markings on limestone boulders near spring on Hall farm, 14CO4 Cowley County.

formation beyond the general location of the petroglyphs; and some survive apparently only as titles of unpublished papers. To this latter group belongs a notice of "The Pictured Rocks of Pipe Creek," a small northerly tributary of the Solomon, in Ottawa County (Mason, 1882, p. 4); and another of "Indian Sculpture in the Upper Medicine Valley," a southerly affluent of the South Solomon in Rooks County (Gould, 1899, p. 10). There is passing mention by Mead (1906, p. 16) of Indian pictographs in the hills up Paradise Creek, a tributary of the Saline which traverses Rooks, Osborne, and Russell Counties. Brower (1899, pp. 77–78) alludes to "an old and weathered inscription upon a rock, said to be of Spanish origin," at a spring near a hilltop on Gypsum Creek, above Roxbury, McPherson County; and to a Spanish flag reportedly cut on stone on Big Creek, in Ellis County. Neither of these localities was seen by Brower. Finally, Stockton (1883, p. 685) reports that a cave in the Verdigris drainage near Toronto, Woodson County, was said to have carvings on the walls.

In the absence of a comprehensive and detailed analysis of Plains petroglyphs, it would obviously be premature to attempt to indicate in how far the groups recorded above are representative of the region generally. Some of the simpler designs, of course, are very widespread, including the rayed disk, ladderlike figures, three-toed bird tracks or tridents, quartered squares, zigzag lines, etc. Indian figures on horseback, heads with horn headdress and/or upstanding hair or plume effects, tipis, bows and arrows, and other designs with late Plains attributes also have a wide distribution in the region. Cuplike pits with attached linear carvings somewhat like those at Site 9 have been reported from Loving County, Texas (Jackson, 1938, p. 137, pls. XCII and XCIII). Rectangular-bodied humans with square or pointed shoulders and outspread arms are not unique to Kansas, but I have been unable to find record of the more elaborate variants, such as those at Spriggs Rocks, in reports dealing with adjoining areas. The fanciful monsters of Site 8, near Minneapolis, likewise appear to have no counterpart among recorded Plains petroglyph groups (cf. Mallery, 1893; Renaud, 1936; Hill and Cooper, 1938).

## OTHER SITES AND LOCALITIES

In addition to the village sites so far discussed, at most of which our observations included excavation, a number of others merit brief notice here. These have all been examined by the writer, but no excavations were undertaken. Since the sites are in localities where no extended work was done by the United States National Museum expeditions, they help to fill in some of the geographic lacunae in our own findings. For such information as is available concerning the occurrences and the nature of the associated artifacts, I am indebted to various private collectors who permitted examination of their materials.

### SITES NEAR BAZAAR, CHASE COUNTY (14CS1)

The principal sites to be considered here are situated a little more than a mile south of Bazaar, in the heart of the Flint Hills upland. They are on the east (right) bank of the South Fork Cottonwood River, which courses thence north by slightly east to join the Cottonwood about 3 miles below Cottonwood Falls. The South Fork Cottonwood is, or formerly was, a perennial hardwood-fringed stream flowing in a narrow flat-floored valley about a mile wide with bordering bluffs 200 feet or more high. The alluvial valley floor, across which the stream winds in a deeply incised channel, is mostly cleared and under cultivation; the bordering bluffs remain largely in grass and serve for grazing of livestock. Rock Creek joins the South Fork Cottonwood from the west just below the sites.

The exact nature of the archeological zone here (14CS1) is somewhat uncertain. The valley floor is actually the broad first terrace, some 500 yards or more wide and extending about 1,200 yards north to south between the river channel and the foot of the bluffs. Here and there may be seen curving swales that look like segments of former river channels. The owners of the property, Frank and George Roniger, have a large collection, mainly of chipped-stone objects, gathered over the years from the terrace; but I have the impression that the materials are, or were, of rather uneven and spotty occurrence. At one point, on the terrace edge overlooking an old channel and some 200 yards east of the present stream, a relatively heavy surface yield prompted the owners to put a bull-dozer into play some years ago. I was informed that a good many specimens were uncovered at the time, that these were chiefly artifacts of chipped stone and bone refuse, and that ash deposits or fireplaces came to light; there seems to have been very little or no pottery, however. At other places on the terrace, plowing turns up small concentrations of limestone blocks and fragments, occasionally fire-reddened, along with chipped flints and rejectage; and it appears that these features are somewhat more plentiful near the foot of the bluffs along the east edge of the terrace than they are farther out on the valley floor. On a short visit to the locality, in August 1953, I found potsherds at only one point—a terrace tip near the present river channel, where bits of grass-impressed wattling clay, small projectile points, bits of charcoal, and shell fragments were also noted.

The Roniger collection includes a very large and varied assortment of chert blades, scrapers, drill points, knives, projectile points, and miscellaneous cutting and chopping tools. Complete analysis and description would require far more time than I have been able to give the material. A good many of the pieces suggest unfinished, or roughly shaped, quarry blanks rather than finished implements. Projectile points vary from small triangular notched and unnotched specimens to large corner-notched and stemmed forms, suggesting more than one cultural complex. Two polished ¾-grooved axes, numerous large corner-notched points, and several chert "cones" are reminiscent of Kansas City Hopewellian materials (Wedel, 1943); and among the surprisingly scanty pottery present, there are several heavy grit-tempered sherds with cord-roughened surfaces, punched bosses, dentate stamp and cord-wrapped stick impressions, zoned decoration, and other traits (pl. 80, *a–e*) that suggest minority wares at the Renner site. I saw no cross-hatched or rocker-roughened body sherds.

Another small group of potsherds ranged in color from brown to orange-brown, had all-over exterior cord roughening on body and rim, direct unthickened and slightly collared rims that were apparently vertical or outflaring, and plain lips, all apparently on large full-bodied vessels (pl. 80, *f–j*). These sherds, I was told, were picked up in association with small projectile points, mainly in the same area where I found similar fragments along with wattling clay, small points, and other detritus suggesting house site remains.

Much of the heavy stonework is reminiscent of that reported by Winchell, Brower, and others at sites south of Kansas River, where it occurs usually with little or no pottery. I am inclined to regard this as workshop material, the stone originating somewhere nearby in the ledges of gray, blue-gray, and other chert with which the Flint Hills abound. The Roniger brothers showed me two probable quarry localities a few miles distant (see p. 480), and informed me that they believe others existed in the region. The cultural affiliations of the people who worked these quarries and utilized the presumed workshop areas remains uncertain; but a Hopewellian or other Middle Woodland period affiliation for some of the remains may be suggested. It is not clearly demonstrable, of course, that the grooved stone axes and other Woodland or Hopewellian materials actually were contemporaneous with the workshop materials; they may belong to a group who camped or lived in the same locality, but without any other connection with the flint work.

On the basis of the very limited ceramic materials I have seen in the Roniger collection, I believe that at least two occupations by pottery-making peoples can be inferred. One of these appears to be assignable to a Middle Woodland horizon, possibly or probably with Hopewellian influence or connections. The other, and presumably later, may correlate with a square pit-house people better known from limited excavations in village sites in the Smoky Hill-Kansas River drainage to the north. Unless and until systematic excavations are possible in the Chase County locality, it is impossible to go further in this matter of suggesting the affiliations of the complexes apparently represented. It is interesting to note further, however, that the ceramic materials which we may presume on the basis of findings elsewhere to be latest here appear to occur along or near the banks of the present stream, whereas the earlier Woodland materials are found mainly at a distance from the present channel and in proximity to old channels whose remnants cross the terrace surface here and there. The possibility of such correlations between temporally distinct archeological materials and the changing topography of the stream valley should, of course, be checked more carefully. From the standpoint of the cultural problems involved, one wonders whether the cord-roughened wares and small projectile points associated with wattling clay represent a square-house agricultural people of attenuated or incipient Upper Republican type, or are perhaps a late Woodland manifestation transitional to Upper Republican.

Other sites and remains were also reported to me in this general locality. Chipped-stone artifacts and burned stones are said to occur on virtually every suitable flood-free terrace along the South Fork Cottonwood from a point below Bazaar upstream to Matfield Green or beyond. Pottery is nowhere abundant, to judge from the information given me. The Roniger brothers stated that buried hearths, some of them at considerable depth, have been noted from time to time at various places along the banks of the stream; but they were unable to show me any diagnostic or other artifacts from such occurrences. A stone-walled or stone-covered burial cairn was opened many years ago on the bluff top east of the Roniger terrace; but there were no artifacts and the cultural affiliations and time horizon of the feature thus remain unknown (but see Eyman, MS.).

That an interesting and important group of sites formerly existed in this locality is clear; and I am convinced that at least two prehistoric horizons are manifested. There is some evidence of a third in two small L-shaped red stone pipes in the Roniger collection, which are very likely to be correlated with the protohistoric Little River Focus remains farther west. All of this strongly suggests frequent and repeated use of the South Fork Cottonwood valley, where arable land, good water, timber, and an abundance of grazing land for bison, elk, deer, and other game animals were formerly found in close proximity to one another. To what extent the several groups actually settled and dwelt here, perhaps growing corn and carrying on their domestic activities for prolonged periods, I cannot say. It is possible that some of the variety in remains noted is a result of the former attractiveness of the locality for hunting groups in quest of plentiful and easily taken game. The picture suggests, however, that a sustained and thoroughgoing effort should be made to disentangle, either at Bazaar or else in some of the other sites nearby, the various aboriginal cultural complexes for which we now have indications in the region.

## SITES NEAR MARION, MARION COUNTY

This locality lies near the headwaters of the Cottonwood River. The town of Marion, formerly Marion Center, is situated about 3 miles east of the junction of the South Cottonwood with the Cottonwood, and at the confluence of the latter with a small stream known as Brook Luta. The river valley here is a mile or somewhat more in width, with bluffs perhaps 100 to 150 feet high. The streams are perennial, with bordering belts of hardwood timber beyond which are the rolling grasslands characterizing the western slopes of the Flint Hills upland.

For such information as is available regarding the archeology of the locality, we are dependent almost entirely on observations and collections made more than 70 years ago. These were made by local collectors, principally one M. O. Billings, of Marion, and by Edwin Curtiss, who opened several earth mounds and rock cairns south of Marion in 1879, under the sponsorship of F. W. Putnam of the Peabody Museum. The exact location of the various features reported by these men remains obscure, but they seem to have lain within 4 or 5 miles of Marion, chiefly to the south of the city and apparently on the west side of Cottonwood River.

In 1881, reporting on Curtiss' fieldwork and certain additions to the collections in the preceding year, Putnam wrote (1880, pp. 718, 738):

> Besides making an examination of a large burial mound in Marion Co., Kansas, Mr. Curtiss removed several cairns nearby. These seem to be the monuments of a later people than those who buried in the mound. These piles of stones, he found, were erected over bodies which had been placed on the bare rock. The skeletons under all the cairns that Mr. Curtiss removed were so much decayed that not a single cranium could be obtained. A number of objects of various kinds were found, which had been placed with the bodies. Among the most interesting of these, perhaps are the several minute pipes made of catlinite. Under one of the piles of stones an arrowpoint of obsidian was found associated with a glass bead. This single glass bead was the only object of European make discovered, but it is conclusive evidence of the comparatively recent period when at least one of this group of cairns was erected.

Among the additions to the museum for 1879 were reported the following:

> 19517-19715. Fragments of clay slate and a large grooved hammerstone from a shell heap near Marion Centre, Kansas; stone pipes, drills, scrapers, knives, hammers, and implements for grinding and polishing, all of stone, from the surface on Mr. Leachman's farm and other places near Marion Centre, Kansas; shell ornaments, flint knives, clay and bones, rubbing stones, grooved hammers, and other implements of stone; a glass bead, bone awl, and other worked bones, obsidian flakes, unio shells, flint drills, arrowheads and hoe of stone, red chalk and pipes of catlinite from cairns on the west side of Cottonwood River, 3 miles south of Marion Centre, Kansas; bone whistle and awl, celt and other implements of the same material, implements of flint and horn, arrow straighteners of stone, and grooved hammerstones from a mound on Mrs. Gibson's farm near Marion Centre, Kansas; . . . .

According to Billings (1883, pp. 211-212), the remains around Marion at the confluence of Cottonwood River and Muddy Creek (Brook Luta?), consisted of mounds "on high ground around the junction of streams adjacent, in irregular groups averaging 8 mounds to the group. Inside of 3 miles each way from Marion there are five of these groups." The mounds, according to Billings, were from 10 to 60 feet in diameter and from 1 to 1½ feet high; they contained no burials. There were also "Smaller mounds [which] seem to be the remains of adobe huts . . . [and] are circular while the large ones have on the southeast side a spur about ⅙ the size of the mound." All these mounds were said to contain trash, pottery, shells, etc. Billings also mentions fire beds (caches?), one of which was 6 feet deep, 5 feet across the bottom, and 3 feet across the top. These he said, occurred at several places. Nowhere does Billings describe any of the artifacts from these sites; but he indicated that the local antiquities could be divided into three categories, namely, Moundbuilders, Cremators, and Modern Indians.

Despite the apparent former abundance of aboriginal materials in the Marion locality, as judged from the observations of Billings and Curtiss, comparatively few artifacts from here seem to have found their way to museums where they were preserved. Probably the best single collection is that made by Curtiss, and now preserved in Peabody Museum of Harvard University under catalog numbers 19517–19613. Most of this, judging from the accompanying catalog entries, came from cairns, not described in detail, 3 to 4 miles south of Marion, apparently on the west side of Cottonwood River; from two earth mounds (middens?) and adjacent plowed fields on "Mrs. Gibson's farm on Cottonwood River near Marion Centre"; from a shell heap on the Bowers' farm; and from the surface of the Leachman farm.[45]

The only field notes left by Curtiss, so far as I am aware, relate to the two mounds opened on Mrs. Gibson's farm. The first of these was 45 by 30 feet, with a height of 4 feet. It was said to contain charcoal, ashes, shells, bones of animals, turtles, and birds, and miscellaneous worked and unworked material of bone, stone, shell, etc. Curtiss says he "occasionally found pieces of pottery, fragments only, and that was made like our southern pottery [with] shells, clay, and sand." Much material was found on plowed fields nearby. Mound No. 2 was close by; it was smaller, about 2 feet high, and contained bones, charcoal, ashes, shells, and other refuse. No burials were encountered in either mound; and from their general nature, as Curtiss described them, there can be little doubt that they were primarily refuse accumulations from a village occupation nearby.

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[45] Neither the very sketchy notes left by Curtiss nor the published reports by Putnam locate exactly any of these sites; and the consistent omission of first names or initials when property owners are mentioned makes it difficult to identify today the farms named. In answer to my inquiry, Miss Lillian Pierce, register of deeds of Marion County, writes (letter of May 24, 1954) that Mrs. Barzilla Gibson owned the S½NW¼ and part of the E½SW¼ of Section 8 T20S R4E, just south of Marion; that Joseph Bowers held title to the E½NW¼ of Section 20, Francis Bowers to the W½NW¼ of Section 20, both these tracts lying west of Cottonwood River; and that John L. Leachman held land in section 18, about a mile west of Cottonwood River on a small unnamed tributary (Spring Creek?) which enters the river a short distance to the southeast. All these lands are south of Marion, within 3 miles of the south edge of the city, and on the west side of the Cottonwood. Exact relocation of the archeological features, if still feasible, will have to be done on the ground.

Among the collections deposited in Peabody Museum is an interesting variety of stone, bone, shell, and other objects. Strangely enough, there is but one potsherd—a straight vertical rim, shell tempered, with diagonal incisions crossing the lip. There are several grooved mauls of varying sizes and materials, including at least one well-made cylindrical specimen of Sioux quartzite with flanges bordering the median groove. Five L-shaped pipes of catlinite or of a fine-grained red sandstone have tall cylindrical to slightly bulbous bowls from 24 to 64 mm. high, with very short stems; the smallest has a single incised line encircling the bowl near the top, another has two lines around the end of the stem, and a third has about a dozen notches cut lightly into the lip of the bowl. Longitudinally grooved shaft smoothers of Dakota sandstone include three matched pairs 13.5–15 cm. long and two additional fragments, all said to have come from "Cairn III, Pile rocks 6′ long." There are numerous chipped flints, including small triangular unnotched projectile points, expanded base and straight (pipe) drills, planoconvex end scrapers, side scrapers, and a variety of notched and beveled knives and other cutting or chopping tools, some of which were fashioned from the banded foraminiferous chert from the "Timbered Mound" quarries described by Gould. Bonework includes a "rib-edge" awl; a bison rib shaft-straightener with single perforation; a polished bone tube, 12 by 52 mm., with dressed ends; a single-stop bird bone whistle, incomplete; and several other odds and ends. There are also unworked freshwater shells, as well as a subcircular shell gorget, 80 by 90 mm., with four central perforations. One obsidian flake and two glass beads, one of them a star bead, were also noted.

Partially supplementing the above collection is a small lot of specimens sent by Mr. Billings to the United States National Museum in 1880, and another received in 1892 from J. W. Lambuth. There are no details concerning provenience of these two lots, except that the Lambuth specimens are said to have been taken from "Ash pits or fire-vaults in Marion County, Kansas." The Billings collection includes several well-made triangular unnotched points, end scrapers, drill points, a flake knife with finely retouched edges, an L-shaped pipe of red stone, and five sherds. The latter include shell and bone-tempered pieces, one of them a plain rim. The Lambuth material includes an incomplete red stone L-shaped pipe, several small fragments of worked bone, and three sherds. One of these is a shell-tempered plainware piece; another is finely sand tempered, with diagonal incisions on the flattened lip. The third is grit-tempered, and bears a band of dentate stamp impressions bordered by wide deep grooves beyond which are undecorated areas.

As to cultural affiliation of the great bulk of these materials, the evidence is open to little doubt. The Curtiss specimens are virtually identical with the protohistoric Little River Focus materials collected by the United States National Museum in 1940 in Rice County, some 75 miles to the west. With exception of the bird bone whistle, every artifact type shown in the Peabody Museum collections from Marion County can be duplicated by regularly recurring items from the Little River Focus sites. So far as they go, moreover, the very small collections in the United States National Museum from Lambuth and Billings also conform. They suggest strongly that the Marion locality was occupied at one time by peoples closely akin to those who left the large sites in the vicinity of Geneseo, Lyons, Lindsborg, and elsewhere in Rice and McPherson Counties (Wedel, 1942). Whether the cairns opened by Curtiss were actually burial sites, I have no way of knowing; they are not described in detail nor are we told how the artifacts occurred in them. The earth mounds Curtiss excavated in the same locality were in all probability refuse heaps. In general, the Curtiss, Billings, and Lambuth collections suggest occupational, that is, village site, deposits much more strongly than they do burial areas; and whatever the actual situation with respect to former mounds in and around Marion, I strongly suspect that there are, or once were, fairly extensive and prolific village site deposits, doubtless including refuse heaps, storage pits, and perhaps habitation units. It would be interesting to know whether the cairns identified by Curtiss as burial structures were also made by the people who left the occupational debris, but neither Curtiss' own records nor the brief observations of others help on this score.

My own observations in and around Marion in 1940 tend to confirm the above suggestions as to the general nature of the aboriginal occupancy of the locality. I was unable to relocate any of the sites certainly dug by Curtiss or to find anyone who knew exactly where his digging was done. However, about a mile southeast of Marion, where a short flowing spring branch enters Cottonwood River from the east, on a pasture bluff overlooking the river bottoms toward Marion, we found three low mounds. These were approximately 40 feet in diameter by 2 or 3 feet high, and about 30 to 60 yards apart. Each had apparently been dug into many years ago, and still had a small sodded depression in the center. A fourth mound, said to have been opened by Billings and others, lay about 200 yards to the west. The only surface finds made by my party included two shell-tempered and two grit-tempered sherds and a few nondiagnostic flints. None of this material conflicts with the suggested Little River Focus affiliation for the Marion materials; and the mounds look superficially like the middens of the Little River-Cow Creek region in

Rice County. To the best of my knowledge, pottery and other materials indicating the former existence of Little River Focus village or burial sites have not been found or reported east of the Marion locality, though occasional L-shaped stone pipes and other items appear occasionally on sites farther down the Cottonwood drainage.

While the great bulk of the materials I have seen from the Marion locality thus indicate a protohistoric occupancy closely related to that represented by Little River Focus sites in Rice County, there are suggestions of earlier penetrations into the area from the east or northeast. Both the Billings and Lambuth collections in the National Museum include sherds of dentate stamped ware with the stamping evidently arranged in zones bordered by grooves (fig. 94). These are without much doubt of Hopewellian type, closely related to materials found at village sites near Kansas City (Wedel, 1943). Among the remains we saw near Marion in 1940, therefore, it is interesting to note the possible occurrence of chambered, or so-called vault, mounds. Some 5 miles south and 1 mile east of Marion, on a high bluff looking northward across an unnamed creek and the Cottonwood valley, we found three small badly disturbed mounds. In two, no stones were visible, and our impression was that they resembled the small earth mounds of the Manhattan locality, 70 miles to the north. The third, approximately 18 feet across, contained a large number of limestone blocks. On clearing some of these away, we found clear evidence of a dry masonry wall on the west and north sides, with a well-made corner in the northwest. Most of the structure, which appears to have measured about 5 by 7 feet, had been destroyed, and we could find no evidence of an entrance passage or vestibule, such as characterizes many of the chambered mounds in the Kansas City area. If this was indeed a chambered burial mound, its occurrence a hundred miles or more southwest of any other recorded structure of the sort and the recovery of Hopewellian sherds in the nearby area, add support to the thesis of a somewhat more intensive penetration by Hopewellian peo-

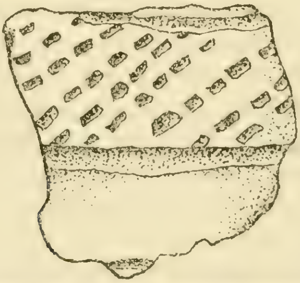

FIGURE 94.—Dentate-stamped and zone-decorated potsherd from vicinity of Marion (USNM 149294).

ples into the trans-Missouri plains of Kansas than we have hitherto suspected (see also Smith, 1949 a, p. 297). I believe that thorough reconnaissance of the upper Cottonwood-Neosho drainage area would probably throw further light on this interesting possibility.

### SITE 14PT1, PRATT COUNTY

This interesting and very promising site is situated on the north, or left, bank of Ninnescah River approximately 1 mile southwest of Pratt. It was brought to the attention of the United States National Museum late in 1953 when Eugene Wing, of Pratt, sent in a series of bone implements for identification and comment. Most of these were recognized at once as so-called "digging stick heads"—a type of artifact not heretofore reported from any sites in Kansas, to my knowledge. To my request for additional information, Mr. Wing responded with lengthy and informative letters and, ultimately, with samples of pottery, stone, bone, and other artifacts collected by himself from the surface of the site. According to Mr. Wing, the location has been known to collectors for many years, and a considerable amount of material has doubtless been carried away by them; his own activities here have been carried on for some 12 to 15 years. So far as is known, there has been no excavation on the site.

According to Mr. Wing (letter of October 30, 1953), "About 100 feet north of the [Ninnescah] river, the terrain forms a bowl about 200 yards long north and south, and 150 yards east and west. In this bowl lies the campsite." In another letter, dated November 12, 1953, he added the following observations: "When this campsite was farmed this last spring, it was plowed deeper than ever before and each campfire showed plainly on the surface of the ground. There were very many and I noticed that they were not arranged in a manner suggesting one camp layout. From this appearance, it seemed to me . . . that this location may have been occupied at several different times." This observation is directly relevant to certain problems arising from my analysis of the artifacts sent me by Mr. Wing.

Artifacts from this site examined at the present writing number approximately 150 specimens. Included are about 100 potsherds, 29 chipped-stone objects, 8 items of ground stone, 17 of bone, 1 of shell, and 1 of glass. To what extent they are truly representative of the total complex, or complexes, represented at the site, I am obviously in no position to say at the moment. They seem, however, to be of sufficient importance and promise to merit description in some detail.

With respect to the pottery, the sherds at hand suggest a rather surprising variety of wares as regards the fabric, surface treatment, and other characteristics—more variety, at any rate, than is exhibited in most of the sites with which my own Kansas researches and excavations were primarily concerned. Since the sample is rather small, I have not attempted to set up and name what may turn out to be distinct types; rather, I have chosen to group the sherds into what I am tentatively calling wares, each described as fully as the handful of specimens permits. If future excavation, and the use of a larger and more definitive sample, confirms the distinctions I think I see, it may become possible to establish types that have true historic or geographic significance.

Ware A, most abundant in our sample, includes 60 sherds, all of which have cord-roughened exterior surfaces (pl. 81, *a*, *b*, *d*, *e*). It is a moderately hard ware, averaging about 3 to 3.5. Paste is of medium fine texture, granular and well compacted, though occasional sherds show a tendency to split. Tempering consists of sand particles, usually rounded rather than angular, from 0.25 to 2.00 mm. in diameter, and moderately to abundantly used. The color is usually gray, but includes browns and red browns. There is nothing to indicate the vessel or base form, but I suspect that moderately large jars were present. The sherds are between 5 and 8 mm. thick. Rims are simple and unthickened, range in height from 15 to 50 mm., and seem usually to have flared or curved outward from a somewhat constricted neck. Like the body sherds, the rims are all cord roughened, with the impressions running vertically, varying a good deal in depth and prominence, and sometimes being more or less obliterated. Decoration is indicated only for the lip, which is characteristically rounded; 10 of the 23 rimsherds have lips with short diagonal incisions or punctations, and 2 have crimping on the inner surface. The only appendage shown is an imperforate lug set vertically on one rim exterior between the neck and lip, neither of which it quite touches (pl. 81, *j*).

Ware B is a plainware represented by 12 body and 5 rim sherds. In virtually all respects, these closely parallel the foregoing except that they lack the cord-roughened surfaces. One lip has diagonal incisions; the others have no decoration.

Ware C includes 4 body and 2 rim pieces. They are distinguished by a relatively fine compact paste, thickly tempered with fine sand in which the individual particles seldom exceed 0.5 mm. On freshly broken edges, the sand gives an almost spongelike appearance to the paste; on sherd surfaces, the grains show as thickly spread fine black specks. One of the rims is thin, plain, and straight, about 5 cm. high, and flares slightly; the other is about 2 cm. high, and also plain. The paste is light gray to brown, and the sherds range in thickness from 4 to 9 mm. These sherds are very similar to pieces I have seen from the Paint Creek site near Lindsborg, and to others collected on the surface at related sites in central Kansas.

Ware D consists of 8 body and 4 rim sherds. These present a thin, moderately hard ware, with very dark fine compact paste generously tempered with fine sand (0.25–1.00 mm.). The sherds are from 3 to 6 mm. in thickness. Rims are high (3.5–5.0 cm.), thin, straight, and apparently outflaring; lips are thinned, rounded, and plain, except one which has small shallow indentations at 10 to 15 mm. intervals. Three of the four rimsherds, apparently representing as many different vessels, show unmistakable simple stamping, with the impressions running vertically (pl. 81, *c*, *f*). There are striking resemblances between these sherds and some of those I have elsewhere described as Scott Plain, the majority ware found by us in middens at the Scott County site (p. 441); but final correlation is not feasible at the moment.

Ware E is represented by a single sherd consisting of about one-third of the rim of a small vessel and adjoining upperbody portions. It is thin (3–5 mm.), and has a fine compact paste thickly tempered with flaked shell. The rim is 20 to 22 mm. high, unthickened, outflaring from a constricted neck, and seems to be from a full-bodied jar. The lip is thinned and bears closely spaced diagonal incisions; at one point it appears to rise slightly as if to a low tab now broken or crumbled away. Applique consists of four closely spaced clay pellets, each pinched into a vertical ridge and applied to the neck; there would seem to have been two such zones on opposite sides of the vessel (pl. 81, *g*). Similar features occur on Geneseo and Cowley wares of the Arkansas valley in Kansas.

In addition to the sherds above described, all doubtless representing wares made locally or at least in the general central Kansas or northern Oklahoma area, there are four or five painted pieces which are certainly of more distant origin. These were submitted to Stanley Stubbs at the Museum of New Mexico. Concerning these, Stubbs writes me as follows (letter of November 27, 1953):

> Three of the sherds are Rio Grande Glaze, probably from the same bowl; one is Biscuit B (Bandelier Black-on-gray) . . .; one is Woodland.
>
> The glaze sherds are the type called by Mera "Group C", or by Kidder "Glaze III." Under either name I would place the approximate date as about 1450 to 1475. The tempering material in these specimens is not too distinctive, but it does match quite closely similar period sherds from San Cristobal ruin in the Galisteo Basin about 25 miles south of Santa Fe. [pl. 81, *h*, *l*, *m*.]
>
> The Biscuit ware sherd is representative of a rather long-lived style from the Tewa area north of Santa Fe, with a time span from about 1425–50 to 1525–50. [pl. 81, *i*.]
>
> The Woodland sherd is unknown to me as to type and age. It shows definite anvil marks and almost obliterated cord marks.

The four puebloan sherds discussed above are of very considerable interest, since they suggest a date for the objects with which they were associated. Moreover, they belong to an earlier time level than do the Rio Grande glaze-paint sherds recovered by my party in Rice and Cowley Counties in 1940 (Wedel, 1942, p. 6; cf. 1947 a, p. 150; and supra, p. 308), as also most of those gathered by others at sites safely assignable to the Great Bend Aspect. As we shall point out presently, they strongly suggest a pre-Coronado dating by perhaps a century; and a pre-White time level is also suggested for the Pratt Site, 14PT1, on other grounds. The relevance of this will be discussed at more length elsewhere in the present paper.

As for the remaining sherd, which Stubbs terms Woodland, I can say little more than that it is unlike any Woodland sherd that I have seen from the Plains area. It has a compact granular structure and is thickly tempered with rounded sand particles that range up to 1 mm. in diameter; crushed bone and some carbonaceous substance also occur as inclusions. The core is gray, as is much of the exterior surface with its nearly obliterated cord roughening; the interior is reddish and has a few blobs of black paint (pl. 81, *k*). The specimen has been examined by Krieger and Bell. According to Krieger (letter of February 19, 1954), the "dabs and smears (might call it 'finger painting')" of black are like those found on sherds from Texas mission sites of the 18th century; but in his opinion the cord roughening probably rules out the area south of Red River as the place of manufacture. Bell comments (letter of March 12, 1954) that "sand-tempered ware is rather rare in Oklahoma for the most part, at least this coarse sand tempering. Bone is used as an addition but I do not recall seeing it mixed with sand as in your specimen." He also suggests the possibility that the present sherd may ultimately fit into the ceramic complex from some other as yet little known and vaguely defined culture horizon of the Washita drainage. For the present, however, it would appear that this piece must remain unidentified as to cultural affiliation and locale of origin.

Work in chipped stone consists of projectile points, scrapers, drills, and beveled knives (pl. 82). These were made from a variety of materials, among them chert, jasper, quartzite, and obsidian. Several specimens are pretty certainly of Alibates dolomite—a pleasingly variegated material aptly described by Kidder (1932, p. 31) as "a purplish-gray stone streaked with darker reddish-purple in much the same way that bacon is streaked with lean." According to Kidder, there are extensive quarries of this material along the Canadian River, near Amarillo, Texas; and Witte (1947, p. 79) has stated that the same or similar stone was available over a considerable area in and east of the Texas Panhandle region. Two or three other specimens, all of them scrapers, are made of banded foraminiferous Florence flint, a Lower Permian formation in which aboriginal quarries have been reported in the vicinity of Maple City, Kans., and Kay County, Okla. (p. 476). The obsidian of which one end scraper was made presumably originated in the New Mexico region.

The projectile points are all small, bifacially chipped, and well made. The basic form is triangular, with straight or slightly concave base and straight to convex edges. Twelve have a single pair of lateral notches, one-fifth to one-third of the distance above the base; one has a basal notch as well, and the remaining specimen is unnotched. The largest point is 39 mm. long; otherwise, all are under 28 mm., and their maximum width is 18 mm. The four scrapers are all of planoconvex type, with the broad end steeply chipped; they are from 37 to 50 mm. long and vary in width from 20 to 30 mm. Drills include one long narrow pipe drill, 85 by 13 by 7 mm., more or less diamond-shaped in cross section, with one rounded and one pointed end, and with blunted edges; and two expanded-base drills with unworked flake bases running out into tapered flattish points 18 to 20 mm. long. There is a much larger and somewhat similarly shaped drill or awl in which a well-made sturdy tapering point 55 mm. long runs out from a heavy flake base which has one edge retouched; the total length is 102 mm., maximum width of the base 32 mm. Of the six beveled knives, two are four-bladed, with opposite edges steeply beveled in the same direction (pl. 82, *n*, *o*); two have two oppositely beveled edges, and terminate in rounding thinned butts; one is more or less broadly lanceolate, with two oppositely beveled cutting edges and rounded butt; and one has both curved and straight edges from which two shallow notches separate a short rounded butt. In size, these specimens range downward from 143 by 37 by 13 mm., a four-bladed piece, to 68 by 28 by 8 mm. There is also one cutting or scraping tool made of a long narrow spall of Alibates dolomite, with one plain concave surface, retouched edges, one end pointed and the other rounded; it measures 87 by 25 mm.

Ground stone is very inadequately represented. There is a small boat-shaped shaft smoother of Dakota sandstone, 85 mm. long, with a deep longitudinal groove which will just accommodate an ordinary lead pencil of 8-mm. diameter; it may have been one of a matched pair, but is rather asymmetrically shaped (pl. 83, *l*). A flat subcircular limestone block, approximately 80 by 25 mm. in size, has one smoothed surface traversed by a groove 10 to 11 mm. wide by 3 to 5 mm. deep, and can perhaps be classed as a shaft straightener; there is a suggestion of a flange 30 mm. long, diagonal to the groove, at one edge (pl. 83, *k*). A pipe fragment of fine-grained dark-red stone may be from a tubular pipe, and is reminiscent of a surface find elsewhere reported from Rice County; it expands gradually from one finished end 16 mm. in diameter, which is encircled by three deep, narrow, closely spaced lines and by a narrow terminal beading, to a maximum diameter of 22 mm. or somewhat more (pl. 82, *g*). The original length and shape of the piece when complete is conjectural. There are five small bits of worked turquoise, the largest measuring 8 mm. in greatest dimension. Four of these are pierced for stringing and appear to be well worn from use; the fifth has one polished surface and smoothed edges (pl. 82, *c*).

In the Wing collection there are also a number of heavier ground stone objects which were not shipped to the National Museum. These include several large sandstone milling slabs, mullers for use with these or similar slabs, and grooved mauls of various sizes and materials.

Among the objects of bone, the digging stick heads are of particular interest (pl. 83, *f–h*). There are seven complete specimens and one fragment. All are made from bison tibiae, and they measure from 15.5 to 28.0 cm. in length. In each, the proximal end of the bone has been detached and most of the anterior surface removed, the latter by cutting diagonally through the shaft of the bone beginning some 6 to 12 cm. above the distal extremity on the posterior surface. The resulting squarish, rounding, or obliquely pointed chisellike edge has, in several examples, been steeply beveled from the posterior surface. In no case is this working edge provided with serrations or teeth. From the articular surface of the distal extremity into the cavity of the bone in each case a nearly circular hole 20 to 25 mm. in diameter has been made; the articular surface around the hole has been fire blackened in one specimen. The cut edges of these tools are usually ground down and smoothed; so far as I can see, there is no good indication that any of the dressing was done with metal tools.

As previously stated, I know of no record of the finding of implements of this type in other Kansas sites, although the manner of hafting by drilling into the end of the bone is certainly reminiscent of that on some of the bison scapula hoes we found in Cowley County (p. 365). There is some resemblance to the bone fleshers or graining tools of the historic Plains tribes, but the present objects are much heavier and sturdier and also lack the usual serrations at the working end. Tools of bison tibia similar to those above described have been reported from late prehistoric and protohistoric sites in Oklahoma and Texas (Krieger, 1948, p. 131), where they would seem to be more common than in Kansas. Similar specimens in the national collections include one piece (USNM 379440) from Lodge A, Mitchell Village site, Davison County, S.Dak. (see Meleen, 1938), and another (USNM 326642) obtained by Myer from a burial mound at the junction of Split Rock Creek and Big Sioux River, Minnehaha County, S. Dak. (Myer, 1922, p. 120 and fig. 123). That they were intended for hafting seems clear; whether they are correctly identified as digging stick heads I cannot say, but the term suggests a plausible use for them.

Other bone tools from the Pratt site include several awls and awllike pieces. Two appear to have been made from split deer (?) metapodials in which the remaining portion of the head was not further modified; they have slender tapering points and measure 75 and 147 mm. in length (pl. 83, *c*, *d*). A third specimen is made from the exterior surface of a split mammal rib, has a short broad tip, and is 163 mm long. The fourth is of the so-called rib-edge type, with triangular cross section and rounded butt, and with one edge retaining traces of the cancellous bone structure. It is 80 mm. long, and the short stubby tip is distinctly faceted, as though from some rubbing or polishing action rather than from piercing (pl. 83, *b*). There is also a large perforator made from half of a split bison tibia, quite likely the reworked remnant of a broken digging stick head. Part of the distal extremity of the bone is present, and on it there is some suggestion of a former perforation or socket. The point is long and tapering, with a flat tip, and very well polished; total length is 20 cm. Quite different from the above is a thin broad spatulate object evidently fashioned from a piece of bison scapula; it measures 165 by 43 mm., and the entire surface and edges are well smoothed from use (pl. 83, *a*). It may be analogous to the "squash knives" of the upper Missouri River region. There are also two scored rib fragments, (pl. 83, *i*, *j*), possibly from musical rasps. One, 80 mm. long, bears 22 deep transverse grooves which originally must have run entirely across the convex outer face of the bone; and there is evidence of use-polish along the midline of the bone, where a stick drawn across the grooves would have worn most heavily on the instrument. The other piece is 62 mm. long and has 6 shallow transverse grooves at intervals of about 8 mm.; it is much weathered so that the zone of wear, if any, can no longer be ascertained.

Two other objects may be briefly noted. One is a small weathered subtriangular bit of shell, measuring 17 by 20 mm., pierced near one edge. The other is a red glass bead, 3.5 mm. in diameter, with opaque white core. So far as the present sample goes, this is the only specimen clearly of white origin.

The materials described in the foregoing pages provide no adequate basis for attempts at classification of the Pratt site, 14PT1, or for other than very tentative efforts at correlation with known archeological complexes elsewhere. The presence of pottery in some quantity and of various implements of husbandry strongly suggest the remains of semisedentary and semihorticultural peoples of late prehistoric age. Beyond this, the limitations of the material are obvious. For one thing it comes entirely from the surface of an area long under cultivation; nothing was found in situ. There is, thus, no real proof that the specimens examined belong to a single cultural complex; indeed, there are hints that more than one time and/or cultural period is represented. The glass bead, for example, does not fit well with the 15th and early 16th century puebloan sherds; neither does the pottery which looks like Dismal River ware, although it must be admitted that we know at present very little as to the time span during which the Dismal River wares were in use. In any case, it seems possible that the site was originally stratified and so includes the remains of two or more cultural complexes of dissimilar age.

My impression at the moment, however, is that a substantial part of the specimen yield, as represented in the sample at hand, probably comes from one cultural complex. If so, it looks like something with southerly affiliations. It is certainly not Upper Republican, as that is known from sites north of the Arkansas River, nor is it Great Bend Aspect (i.e., "Paint Creek culture"). From both of these, the ceramic assemblage at Site 14PT1 differs appreciably in general composition and in numerous details. The bone and stone objects have some counterparts in these two horizons, but there are also notable differences. Thus, for example, the bone rasps and awl types (split-rib and rib edge) equate with Great Bend types, but the digging stick heads do not; and none of these items is found in Upper Republican. The small projectile points, predominantly side notched, are unlike most of those from Great Bend sites, where simple unnotched triangles prevail. The puebloan sherds, as already pointed out, suggest a time level preceding the Little River and Lower Walnut Foci of the Great Bend Aspect, though not necessarily by very many decades.

As a guess, I would suggest that the Pratt site, or the principal occupation (including Wares A–C, and E) if there was more than one, perhaps dates between circa A. D. 1400 and 1500, thus definitely antedating the Great Bend Aspect sites investigated in Rice and Cowley counties in 1940 but probably following in time the main Upper Republican occupation of northern Kansas. It may, then, equate in time with a late stage of the Panhandle Aspect (Krieger, 1946), though it does not show striking similarity to either the Antelope Creek Focus (Krieger, 1946, pp. 41–74) or the Optima Focus (Watson, 1950); or else with one of the late prehistoric cultures of south-central Oklahoma, such as the Custer or Washita Foci (Bell and Baerreis, 1951, pp. 75–83). When more detailed and better controlled data are available from Pratt, I am sure its closest relationships will be found to be with one of these Oklahoma cultures rather than with anything we now know from the Arkansas River valley north. It may well prove to stand intermediate, chronologically and perhaps culturally, between one of these late prehistoric Oklahoma manifestations and the Great Bend Aspect sites of central Kansas.

That further information is to be gotten from the Pratt site I am quite sure. Some of the sherds sent me by Mr. Wing are comparatively large, and hardly seem like the sort of pieces that would lie long on the surface of a cultivated site under close scrutiny by numerous collectors over a long period of time. The bone tools have, in general, a fresh unweathered look, and I doubt that they were long on the surface or even in the immediate subsurface zone subject to repeated turning in modern cultivation. Finally, it will be recalled that Mr. Wing noted many new "campfire" sites recently brought to the surface by deeper plowing. All this suggests to me that additional material may lie beneath the surface, perhaps deposited as refuse in abandoned cache pits, on the floors of semisubterranean house sites, or in association with other subsurface features. If this be so, systematic excavations would seem to be in order; I suspect they would well repay the excavator. Moreover, they would probably show whether the artifact assemblage represented by the small sample here discussed is actually a single complex or, alternatively, includes two or more archeological cultures.

Another small lot of specimens received from Mr. Wing consists of material from an Indian grave (14PT2) situated about a mile downstream from Site 14PT1. This was uncovered by power machinery in course of construction, and nothing was saved except these specimens. There is no way of telling at this date how or in what association they occurred with respect to the burial, which was obviously of no great antiquity.

The specimens include two shell hair pipes, both complete and in good condition (pl. 84, *a*). They measure 120 and 126 mm. in length; each has a maximum diameter at the middle of 10 mm., whence it tapers to 5 mm. at the ends. The perforation is cylindrical, 1.5–2.0 mm. in diameter. There has been some weathering and slight scaling, and each has patches of brown incrustation.

There is also a bowl from a white clay trade pipe (pl. 84, *c*). This is plain, with the mold marks clearly indicated; it is about 35 mm. high, and includes a very short stub of the stem. On the side toward the smoker there are two raised block letters—T D; no other decoration, marks, or appendages of any kind appear. It is apparently in late 18th- and early 19th-century style.

Glass beads consist of 113 blue and 63 white "seed" beads. These approximate size 0, averaging 3 mm. or a trifle more in diameter and running about 10 or 11 to the inch, strung (pl. 84, *b*).

The hairpipes strongly suggest a post-1800 date for the grave, since they are without question of the type manufactured in Bergen County, New Jersey, after the last quarter of the 18th century and distributed to the western Indian trade from Lewis and Clark's time on (Westervelt, 1924; Wedel, 1955, p. 165; Ewers, 1957). The pipe fragment and beads are in no way contradictory to such a dating.

The grave, therefore, cannot have been in any way connected with Site 14PT1, doubtless abandoned long before this time. As we have seen, the region west and south of the Arkansas River was hunted over by a number of tribes during the 1800's, including the Osage and Kansa from the east and northeast, the Pawnee from the north, the Kiowa and Comanche from the west and southwest, and doubtless by others. Any one of these tribes could have made the burial in course of a war or hunting foray; and since there are no skeletal materials on which to base a judgment as to possible affiliation of the deceased, further identification of the grave is impossible.

### SITE NEAR SALINA, SALINE COUNTY (14SA1)

Four miles east of Salina, on the north bank of the Smoky Hill River, is located a site (14SA1) of more than usual interest. Excavated mainly between 1936 and 1940 by G. L. Whiteford, Salina police sergeant, and his family, its principal features consist of village remains and a burial ground, both clearly of pre-White age. The burial ground includes remains of 140 or more skeletons, many of which were found in a good state of preservation; and most of these, along with the associated pottery, stone and shell artifacts, and other finds, have been left in situ for public exhibition at a modest fee. A full report cannot be made here; but in view of the obvious importance of the findings for Kansas prehistory a summary statement may be worthwhile. My account is based primarily on observations made by myself and my wife in the summer of 1940, during a short stay as guests of Mr. and Mrs. Whiteford, then operators of the project; and secondarily on correspondence and on two popular pamphlets prepared by Mr. Whiteford (Whiteford, 1937, 1941).

The site is situated on a broad alluvial terrace—actually the flood plain—between the Smoky Hill and Saline Rivers, which join a little more than a mile to the east. Both streams meander freely as they approach their juncture; and the flat flood plain formed by their converging valley floors is marked by numerous old meander scars. At present, the Smoky Hill is the nearer stream, its serpentine trench skirting the south edge of what was apparently a village area of considerable, but undefined, extent. I am unable to say how closely the zone of former habitation approaches the winding channel of the Saline River to the north and northeast. Both streams are fringed with hardwoods and are perennial in nature; and the fertile alluvial bottoms, 4 or 5 miles wide and broadening toward the west, would undoubtedly have furnished a very desirable habitat for a considerable population of semisedentary corn-growing Indians.

The observed village remains consist of low inconspicuous elevations, or house mounds, scattered loosely over the terrace. These have been nearly obliterated by many years of agricultural activities; and it is quite likely that the 12 or 15 mounds visible in 1936 represent only a fraction of the habitations that once stood on the area. Most of the mounds, actually house sites, remain unexcavated, their location being apparent only when crops have been removed and plowing brings to the surface bits of wattling clay, broken musselshells, flint chips, bones, and occasional potsherds. There is no evidence of fortifications or other earthworks of any sort. I have the impression that many of the mounds are at considerable distance from the present stream channels; but in the absence of closer observation, or of a detailed map of the site and its terrain, I am unable to say how closely, if at all, the old house mounds correlate with one or another of the ancient channel scars that cross the terrace. I would be inclined to suspect that careful plotting of these features might show that the house sites and village arrangement conform more closely to some former stream channel than they do to the present watercourses. Evidence for a correlation of this nature at a prehistoric village site on the Solomon River some 18 miles north of Salina has been presented elsewhere (Wedel, 1935, p. 218).

The Whiteford excavations in the village site were extremely limited, including the clearing of one house site and part of a second; but this work strongly suggests that the native structures were earth-covered semisubterranean lodges of a type long familiar to archeologists in the Central Plains.

House 1 was situated about 200 yards from the bank of Smoky Hill River and some 1,750 feet southeast of the burial ground. Rectangular in outline, with rounded corners, it measured 30 by 32 feet, with the long axis north-south (Whiteford, 1941, pp. 14–18). The floor lay 18 inches beneath ground surface; at its center was the fireplace, a shallow basin 39 inches in diameter by 9 inches deep, filled with white wood ashes and burned to a deep red by prolonged use. Four large post molds, 11 to 15 inches in diameter, formed a 14-foot square about the fireplace; and the secondary or outer series of house supports consisted of 25 smaller post molds, each 9 to 13 inches in diameter. The entrance was poorly defined, but is believed to have opened toward the east. Four large deeply worn mealing slabs lay about the hearth between the four center post molds, one slab lying between each pair of holes north, west, south, and east of the fireplace. Beyond these slabs, and outside of the central square, were five cache pits—one each to the east, northeast, north, west, and south of the fireplace. These cache pits yielded very little material, having apparently been emptied of their stored contents before abandonment of the house; but a considerable amount of refuse and artifactual material was found on the floor and in the fill immediately above.

House 2, situated some 150 yards west of the burial ground, was approximately half excavated. Features definitely established by its partial excavation included a central fireplace, clay-lined and ash-filled; three cache pits, lying southeast, southwest, and northwest of the fireplace; four central roof supports forming a square around the fireplace and located between the latter and the three cache pits; and a general depth of the floor below ground level of about 18 inches. The structure is believed to have had about the same dimensions as the first house opened.

Cultural materials obtained during excavation of the house sites included products in pottery, stone, bone, and shell. Since no significant difference is apparent in the remains from the two units investigated, all may be considered together here.

Ceramic materials include the following from house 1: three whole, or nearly whole and thus restorable vessels, considerable fragments of four other large vessels, and approximately 160 body and 12 rim sherds; from house 2 were taken approximately 300 body and 30 rim fragments, but no complete or restorable vessels. All of this material appears to represent one ware. It is characterized by a gray, moderately hard paste with gravel inclusions, often in angular particles, and it has a coarse granular fracture. None of the fractured edges suggests coiling, nor is there any other evidence of such a shaping process. Surface color varies from light gray to dark gray and orange-brown, and firing clouds occur commonly. Almost without exception, the sherds and the vessels present have exterior cord-roughening; interior surfaces are carelessly smoothed and uneven. Sherds and vessel walls range in thickness from 5 to 12 mm.

Vessel forms represented include chiefly large full-bodied jars (pls. 87, *b*; 88); I recall nothing suggesting bowls, bottles, or other shapes. The characteristic form shows a body in which height equals or somewhat exceeds maximum diameter, with some tendency toward a subconoidal profile; a high rounding shoulder and flattish upperbody are also common. The neck is usually constricted, with a low unthickened vertical to slightly flaring rim 2 to 4 cm. high. The complete and restored vessels range in maximum diameter from 29 to 37 cm., and in maximum height from 26 to 33 cm. All of these, as well as the larger vessel fragments, bear all-over cord roughening on their exteriors, this usually continuing up the outside of the rim to the lip. A small minority of the rim fragments show some thickening to form a collared, or braced, rim; and these sometimes have the lower edge of the collar pinched up into small nodes. According to my notes, most of the collared rims were taken from house 2, where 5 of 9 specimens bore cord roughening only, one was cord roughened with nodes along the lower edge, one had oval diagonally placed lip incisions and three parallel incised lines on the outside panel of the collar, and one had two incised lines zigzagging around the vessel with the lower edge of the collar pinched up into narrow vertical ribs or nodes. Four or five vessel handles are also indicated, and in one or two instances these were evidently tenoned at the lower end for insertion in the vessel wall.

In addition to pottery, two rudely modeled objects of fired clay were found in house 1. One of these, a so-called "owl" effigy (pl. 92, *i*), consisted of an elliptical flattened mass measuring 87 by 55 by 35 mm.; near one end are two circular depressions, each 8 mm. in diameter, possibly representing eyes, and between and slightly below these is a ridge of clay 16 mm. wide and about 30 mm. long, which suggests a nose or beak (Whiteford, 1941, p. 15, fig. 3 left). The second is described as "a piece of clay 2 inches in diameter by 3½ inches long. By rolling the clay into this size and shape while it was pliable, the maker had used his forefinger to hollow out one end just below what would be called the rim where there were three small holes, one on one side and two just opposite" (Whiteford, 1941, p. 18 and p. 15, fig. 3, *right*). My notes include nothing on this piece, which Whiteford further says was identified by an old Potawatomie Indian as a "war club."

Still another pottery item is of especial interest because of the virtual certainty that it originated in another region. This is a clay pipe fragment found in cache 1, house 1. It has a light-buff paste, fired very hard, and is thickly tempered with crushed quartz; part of the bowl cavity is still discernible on the broken surface. The finished surface is well smoothed and has a light reddish-brown color. It shows (pl. 91, *b*) a forearm, from the elbow down, with the spread fingers of the hand resting on the bent knee. Without much doubt this represents a piece of a human effigy pipe; and since neither the fabric nor the subject represented conform to local traditions, importation from another culture area is strongly suggested. A likely source would seem to be the Arkansas River valley in eastern Oklahoma where, as at Spiro, effigy pipes of stone showing seated or kneeling human figures with hand on the knee are not uncommon (Hamilton et al., 1952, pls. 7–15); or the somewhat more distant Red River valley where, as at the Gahagan site in northwestern Arkansas, similar items in pottery have been found (Webb and Dodd, 1939, p. 103 and pl. 25).

Chipped-stone objects include projectile points, scrapers, and knives. Among 15 projectile points, 7 are triangular and unnotched, 6 have one or two pairs of lateral notches, 1 is corner notched, and 1 is stemmed; they range in length from 24 to 40 mm., are bifacially worked, and are generally of inferior workmanship. End scrapers include 9 specimens, all with one planoconvex surface and the other prominently ridged; they vary in size from 39 by 23 mm. up to 83 by 25 mm. The largest of these is of pink mottled chert containing fusulinid fossils and another is of finely banded chert, both specimens suggesting the material found at the aboriginal quarries near Maple City, Kans., and Hardy, Okla. The knives, five in number, vary in outline from more or less lanceolate to roughly quadrilateral, the latter with adjacent edges oppositely beveled and having pointed ends; they range in length from 71 to 103 mm., in width from 27 to 32 mm. There is also one flake knife made from a long narrow spall; it measures 47 by 12 mm., and has finely retouched edges.

Work in ground stone includes several mealing slabs, four of which occurred, as already noted, around the hearth in house 1; a fifth came from one of the cache pits. These were of sandstone, 28 to 45 cm. wide, 10 to 13 cm. thick, and up to 55 cm. long; all show an elongate depression on the upper surface, apparently from a rotary grinding motion. Several mullers, or handstones, for use with these slabs, also came to light. Paired sandstone shaft smoothers of the familiar boat-shaped Plains type are indicated by a number of fragments, including two fragmentary unfinished specimens in which the blank had not yet been split apart to make the pair. The only complete smoother was 10 cm. long by 35 mm. wide by 30 mm. thick; but larger specimens are suggested by some of the other fragments. Two celts came from house 1; the larger is petaloid, with polished blade and chipped and worn butt, and measures 13 by 6.3 by 4 cm. The smaller, 6.5 by 4 by 1.8 cm., also has a polished blade and a partially chipped surface. There is also one unfinished pipe blank, 6 cm. long by 6.5 cm. high; the stem projects slightly beyond the bowl, which flares toward the top and has a single deeply incised line encircling its upper portion, (pl. 92, *f*). The surface is covered with grinding striae. Hammerstones of sandstone, quartzite, and other hard materials were fairly common; they ranged in diameter from 5 to 8 cm. and in thickness from 4 to 6 cm., and have heavily battered ends and edges.

Bonework includes several fragments of bison scapula digging tools; one highly polished bison ulna punch, 8.5 cm. long; a gouge or scraper 17 cm. long, made from the shaft of a large mammal leg bone and well polished from use; several awls of split mammal bone; and several fragmentary tubes and cylindrical beads. Two fragments of deer metapodial, 9.5 and 10 cm. long, are heavily polished near the broken ends; almost certainly they represent a beamer or beamers, worn through and finally broken from long use.

Artifacts of shell were not very plentiful, although there were many unworked musselshells from the house floors. From cache 5, house 1, came a series of 7 Unio shells, ranging from 85 by 64 mm. to 120 by 114 mm., each with an irregular central hole and much worn ends, and five similarly perforated fragments. These I suspect represent blades, perhaps for digging tools (pl. 92, *k*). Two other Unios and a fragment of a third have coarsely and irregularly serrate edges opposite the hinge. There were also a few shell disk beads and portions of what may have been small pendants. So far as I am aware, all of these shell objects represented fresh-water forms.

The burial ground is on the south slope of a low sandy knoll some six or seven hundred yards from the Smoky Hill River, surrounded by the alluvial bottom lands on which the house mounds are scattered. The burials uncovered at time of our visit in 1940 occupied an area measuring approximately 32 by 45 feet, the long axis running north-south. The fill is dark gray, presumably humus stained, in its upper portions and around the burials; below, it fades into a light yellowish-buff undisturbed soil, the lower limit of disturbance by burials varying between 24 and 48 inches. There is no visible "loading" or other indication of artificial mound construction, but considerable evidence of disturbance by burrowing animals. Burials ranged in depth from 3 to 34 inches; some of the shallow interments were so near the ground surface that, but for the fact that the knoll has long been occupied by farm buildings and thus remained unplowed, it is probable that cultivation of the spot would have disclosed the burial area long ago.

While I am unable to give exact figures on the total number of burials uncovered, it appears that approximately 140 individuals are represented. These include both sexes and all ages, from small infants to adults. Owing to the fact that most of the skeletons crowded into this limited area were left in position for exhibition purposes, which means that some of those found at lower levels were only partially uncovered, I cannot give full data regarding each of the numbered burials. The incomplete tabulation which I prepared in the field is therefore omitted, and only my general observations will be recorded here. These, of course, are subject to modification or revision if the burials are ever removed completely and their manner of occurrence and associations carefully plotted and noted down.

The vast majority of the burials, and perhaps all, can safely be designated primary or flesh burials rather than secondary interments (pl. 85). According to Whiteford (1941, p. 4), the interments were "placed four layers deep." So far as I am aware, no convincing evidence of individual grave pits was found. Partial or complete flexion of the corpse seems to have been the rule, the knees and flexed lower limbs generally forming a right or obtuse angle with the line of the trunk (pl. 86, *a*). The bodies were usually placed on their sides; and there is some evidence that the favored orientation was with head to the south, the body lying on its right side with the face toward the east. There are, however, a number of exceptions to this generalization; and skeletons with the head to the east, north, and west, or to intermediate points, and disposed on the left side, are by no means uncommon. A number of skulls apparently dissociated from other bones were noted; but in some instances, at least, this was probably due to incomplete excavation because of other nearby skeletons left in situ. Similarly, the presence of a few small clusters of long bones suggesting bundle burials is perhaps to be explained on the basis of incomplete excavation. The activity of burrowing rodents has already been noted; and this, of course, is a factor to be borne in mind with reference to apparently fragmentary skeletons. Nowhere did we note any definite nesting or orderly segregation of grouped skulls only, any orderly piling up of long bones of several individuals, or any real evidence of complete disarticulation—considerations which might have suggested the secondary interment of dismembered bodies resulting from previous exposure to the elements. Such scattering of bones and disarrangement of skeletons as we observed is probably a result of disturbance of earlier burials by later ones, because of continued use of a highly restricted burial area, or else can be explained in terms of other factors already noted above. In other words, my observations produced no convincing evidence of anything other than repeated interment of articulated bodies over a long period of time.

Among the massed burials were found a number of artifacts of pottery, stone, shell, and bone. With one or two noteworthy exceptions, these generally parallel closely those recovered in the nearby house site excavations, and thus serve to link the burials with the inhabitants of the prehistoric community that once occupied the surrounding village or villages.

No less than 16 whole or restorable pottery vessels were taken from the burial ground. All were made from the same grit-tempered cord-roughened ware already described from the house units. In comparison with the vessels from the houses, they were, however, uniformly smaller in size, ranging in maximum diameter from 9 to 17 cm., and in maximum height from 8 to 16 cm. In form, they were mostly globular, or very nearly so, with constricted necks and simple unthickened vertical to flaring rims (pls. 89, 90). In two specimens, the rising rim was omitted, resulting in a sort of coconut-shaped jar (pl. 87, *a*). With a single exception, none of these vessels shows any attempt at decoration by incising or other techniques, and none has handles or other appendages. Among the 50 or 60 miscellaneous sherds also recovered during the clearing of the skeletons, practically all were again grit tempered and cord roughened; only 5 or 6 showed no cord-roughening, but these appear to have been from vessels in which the surface-texturing had been removed through use. Two rimsherds have a slight collar whose lower edge has been notched or scalloped.

The single exception noted above is a large portion of a jar of grit-tempered cord-roughened ware, which was apparently some 20 cm. in maximum body diameter and perhaps 17 cm. in height. It appears to have had a rounded shoulder, flattish upperbody, constricted neck, and vertical unthickened rim terminating in a plain rounded lip. The exterior surface to the lip is cord roughened; from the neck nearly to the base its surface bears also crudely incised simple curvilinear and rectilinear motifs (pl. 91, *a*). Except in its slightly greater size and in the incised ornamentation, this piece does not differ significantly from the other vessels found in the site.

Of outstanding interest among the burial ground finds is the large pottery fragment illustrated in plate 91, *c*, which is clearly not of local manufacture. It has a dark-gray fine paste, and is very hard and well fired. Tempering is uncertain, but fine gravel particles are visible. The exterior surface, where not modified by decoration, is well smoothed and polished. The sherd includes about 14 cm. of the vessel rim, and has a plain rounded lip. The piece is evidently from a deep shallow-bottomed bowl with slightly constricted side walls; and projection of the curves of the sherd results in the reconstruction shown in figure 95. As reconstructed, the vessel would have had a rim diameter of approximately 27 cm. and a maximum depth of approximately 18 to 20 cm. The arrangement and nature of the decoration, done by incising and wedge-shaped punctation, may be seen in the accompanying illustrations (fig. 95 and pl. 91, *c*). I would suppose that there were originally four such units of ornamentation around the bowl. The closely spaced and deeply incised lines filling the upper part of the central band of decoration still contain traces of a red pigment, as does the second chevron line from the top.

This sherd is unlike any pottery I have ever seen from Kansas; and like the pottery effigy pipe fragment described above from cache 5, house 1, it suggests importation from some locality well to the south of the Salina district. Krieger (letter of October 18, 1954) and Bell (letter of November 10, 1954), to whom a photograph was submitted, agree that the sherd represents without question the pottery type

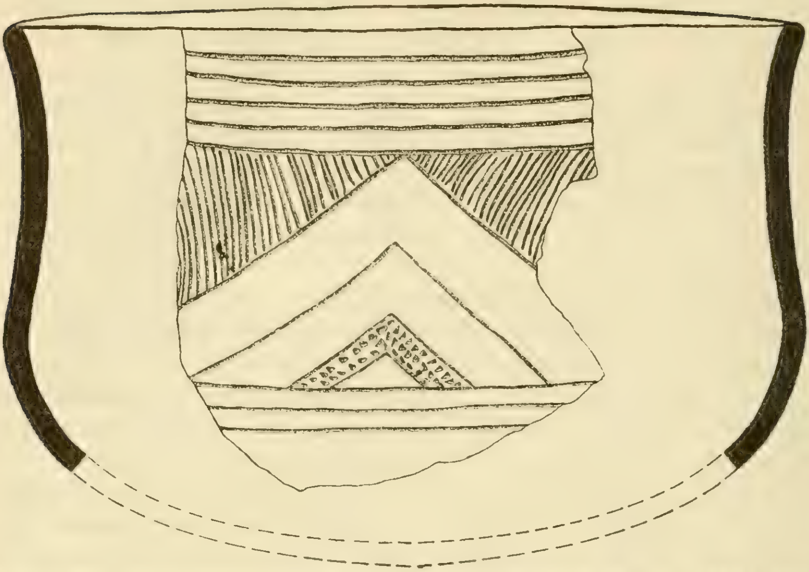

FIGURE 95.—Crockett Curvilinear Incised sherd from Salina burial pit, 14SA1, and reconstruction of bowl shape indicated.

Crockett Curvilinear Incised (Newell and Krieger, 1949, p. 98). This ware occurs in sites of the Spiro Focus in eastern Oklahoma, and also in Haley Focus sites in southwestern Arkansas (Harrington, 1920, pl. 27, b, and 58, a). The known distribution of sites to which this ware is native is some 250 to 300 miles or more south and east of the Salina locality.

Chipped-stone objects from the burial ground include approximately a dozen knives, mostly of brown jasper, and three small projectile points. The knives include several narrow more or less lanceolate to four-edged specimens with adjacent edges oppositely beveled (pl. 92, *d*), these ranging in length from 9 to 15 cm.; and at least two large well-made pieces that are slightly curved and have rounded ends (pl. 92, *b*, *c*). The larger of these (pl. 92, *b*) is 25.5 cm. long by 5.5 cm. wide; the second measures 19.5 by 5.7 cm. Both are of brown jasper, and have traces on one or both surfaces of the limestone matrix that enclosed the thin vein from which they were taken. So far as my notes indicate, only one small knife can be said to have been directly associated with a specific burial; most, apparently, were taken from the fill between burials and their exact associations are unknown. The smaller knives, of course, closely parallel several specimens found in the house site excavations; the larger and finer pieces, both of which show excellent retouching of the edges, may have been prepared especially for burial with the dead.

The projectile points include one straight-based specimen, 25 by 16 mm. with two notches on either lateral edge; one convex-based specimen, 19 by 10 mm., with a single pair of lateral notches; and one with broken base but evidently also with notches. The association of these points, if they were found with particular burials, is not recorded in my notes.

Ground stone objects consisted of a crudely fashioned limestone celt, 12 cm. long (pl. 92, *e*), which lay beside a chipped knife at the back of the cervical vertebrae of an adult female skeleton, burial 22; and a large sandstone mealing slab, 53 by 43 by 10 cm., found at a depth of 8½ inches near burial 75 at the southeast edge of the burial area. I am informed by Whiteford (letter of November 6, 1939) that a "piece of turquoise, about the size of a small marble, green in color with some matrix" was found with a child burial.

Shell artifacts were somewhat more common than stonework (pl. 92, *j*). They included disk beads, varying in diameter from 2 to 12 mm., and occurring mostly singly or in small clusters scattered throughout the fill among the skeletons. Noteworthy occurrences otherwise included some 40 or 50 disk beads apparently forming a 21 cm. segment of a necklace with burial 74; approximately 150 disk beads found with burial 107; and about 15 disk beads with burial 148. Although I did not count all of the individual beads present, I doubt that the total number exceeded three or four hundred. There were also two or three larger disks, either of shell or of limestone, ranging from 16 to 25 mm. in diameter; and a few small barrel-shaped beads. Pendants are represented by about a dozen slender tapered shell objects, up to 60 mm. long, and all with a single perforation at the larger end. One of these lay near burials 126–127, an adult female and child; two perforated butt fragments lay one on each side of the skull of burial 113, a child, their placement suggesting ear ornaments; and five were with burial 148, an infant, with which were also associated 2 cylindrical shell beads 10 to 12 mm. long, and a few shell disk beads. Four perforated butt fragments, 38 to 65 mm. long, were apparently not associated with any specific skeleton. Unworked fresh-water musselshells occurred here and there throughout the fill among the skeletons.

Artifacts of bone were very scarce. With burial 137, an adult male, was a fragment of what may have been a bone needle. Turtle carapaces, in some instances accompanied by other bones of the skeleton, occurred with at least 4 burials; but my notes do not record the degree of modification, if any, which these objects had undergone. In some cases, they may have been the remains of animals which died in burrows rather than actual burial accompaniments.

Small quantities of charred corn were noted in two places—with burial 133, an adult female, and in the general vicinity of burials 99 to 100, which were fragments of skulls of children. There is no evidence that any of this was intrusive to the burial ground. Charring was noted on a very few of the human remains—too few, it would seem, to be acceptable proof of cremation practices.

Because so little properly controlled information is at present available on the archeology of the Salina district, sweeping conclusions seem unwarranted at this time. Even the material reviewed in the immediately preceding pages gives a less clear-cut picture than is desirable, and it obviously needs to be supplemented by further studies. I think we may safely infer that the remains in the burial ground can be identified with the inhabitants of the earth-covered lodges that were once scattered over the surrounding bottoms; that these people followed a semisedentary mode of life based in part on corn-growing; and that they lived in a period antedating the arrival of white men. But while the general nature of their mortuary practices and community pattern can be thus inferred, many questions must remain still unanswered. Why, for example, is there no evidence of dug grave pits when individual interment in the flesh seems so clearly indicated? Why were the burials crowded into such a relatively restricted space when equally suitable ground was available in all directions? Over how long a period of time was this particular tract utilized for disposition of the dead, and from how extensive an area were the deceased brought to this spot? I suspect that not only the dozen or so house units noted in the immediate vicinity were involved, but that there may have been other small clusters of habitations scattered along the bottoms for some distance from which the dead were brought to an established cemetery over a period of perhaps several decades.

The cultural and chronological position of the Salina materials here discussed will be considered again in another place, but a few remarks are in order at this point. There appear to be significant resemblances to prehistoric remains previously reported from the vicinity of Minneapolis on the Solomon River (Wedel, 1935). The ceramic remains are not identical with those from Minneapolis, but the relationship is very likely a close one; and there is substantial identity in such other items as projectile point types, chipped knives, stone pipes, ground celts, the metate-mano complex, the earthlodges, and probably in the village pattern. Further investigations in the village site at Salina might well lengthen the list of similarities. Farther afield, the Salina materials are also somewhat reminiscent of Upper Republican remains in southern Nebraska; and the shell disk beads and tapered pendants taken from the burial ground are identical with those from Upper Republican burial sites (Strong, 1935, pp. 112, 123; pl. 9, fig. 2, i, j, l–n), even though the mode of interment is not. I suspect that as systematic fieldwork goes forward in the central Kansas region, it will be found that the cultural complex represented at Salina recurs, doubtless with local variations, throughout a wide area in the drainage of the Smoky Hill-Kansas river and probably southward into the Arkansas drainage. Its exact relationship to the "classic" Upper Republican sites of Nebraska and northern Kansas remains to be worked out.

That the Salina materials are prehistoric in time seems incontrovertible. So far as I am aware, no traces of contact, direct or indirect, with white men have been unearthed in the village site or among the burials. The general resemblance of the material to that from Upper Republican sites in Nebraska, where White trade goods are likewise totally absent, seems confirmatory. Finally, the discovery of a human effigy pipe fragment and of a bowl sherd whose time and place of origin is almost certainly in the prehistoric Spiro Focus of eastern Oklahoma, is also in line with this view. The latter finds, of course, aside from their importance for cross dating, are of further interest for their suggestion of prehistoric trade relationships or other contacts between Central Plains peoples and others more closely related to the native cultures of the Southeast.

The skeletons gathered together at Salina offer, of course, an unusual opportunity to the physical anthropologist. Rarely does the archeologist in the Central Plains find such a large series of measurable human remains in unquestioned association with cultural materials that can be correlated with defined prehistoric complexes; and the occasion thus afforded for identifying the physical type or types represented, for relating these to other native populations in the general region, and for studying the diseases and disabilities which may have afflicted the pre-White populations should not be overlooked.

## SITES IN TUTTLE CREEK RESERVOIR AREA ON BLUE RIVER

Elsewhere in the present report, I have commented briefly on archeological remains along the lower Blue River near Manhattan. As Brower's reports (1898, 1899) long ago suggested, this locality evidently contains a variety of materials representing several ceramic cultures of differing antiquity. Further evidence for this view, together with indications of what may well represent preceramic horizons, has been provided by the investigations of the River Basin Surveys in the Tuttle Creek reservoir area. These include a reconnaissance by Ralph Solecki and J. M. Shippee in the summer of 1952, and limited excavations at occupational and burial sites near the dam in 1953 by a party under Robert B. Cumming. The collections made by Solecki and Shippee have been deposited at Kansas State College, Manhattan; those resulting from Cumming's excavations are in the United States National Museum.

Tuttle Creek dam is situated approximately 6 miles north of Manhattan, just above the junction of McIntyre Creek with Blue River. Designed entirely for flood control, it will have an impoundment area extending up the Blue some 40 airline miles to within 3 or 4 miles of Marysville, including the Little Blue beyond Waterville, the Black Vermillion to Frankfort, and the lower reaches of Fancy, Mill, and other tributary creeks. Within this area, the tree-fringed Blue flows in a flat-floored trench approximately 1½ miles wide, bordered by steep bluffs up to 200 feet or more in height, beyond which are the rolling grassy uplands. The Florence limestone, which contains abundant nodules of steel-gray chert, is an important formation in the geologic structure of the valley bluffs. Although no native quarries have been reported, this was doubtless the source of much of the gray and blue-gray chert, often banded, used so widely by the Indians of northeastern Kansas in the manufacture of projectile points, scrapers, and other chipped implements.

Solecki and Shippee recorded a total of 119 sites of archeological interest within the area of their survey; but since ground conditions were unsatisfactory, they were of the opinion that a considerable addition to this figure might be made with further search at other seasons. Included in their findings were at least 8 village sites from which came pottery fragments, bits of burned house daub, occasional milling slabs, and other materials suggestive of earth-lodge remains; 5 mound locations, all situated on the bluffs overlooking the valley; and 106 large and small camp sites whose age and cultural relationships remain undetermined. Among the pottery collected were samples of both plain and cord-roughened wares, from which the presence of variants of Upper Republican, Woodland, and perhaps other prehistoric complexes was inferred. The campsites are not described; I suppose they involve primarily nonceramic zones suggesting hunting or gathering stations. Two of these are of especial interest. At Site 14MH33, on the right bank of Blue River not far below the Black Vermillion, was found the basal portion of a projectile point identified as of Plainview type. North of Vliets and outside the reservoir area, at Site 14MH75, large projectile points are said to have been picked up from time to time and these include a fluted point reminiscent of the Folsom type. These are both surface finds, and by themselves prove nothing; but they point up the urgent need for further search in the locality for possible preceramic and early hunting manifestations.

The excavated Tuttle Creek materials transferred to the National Museum originated in two small occupation sites and a burial mound, all situated within a few hundred yards of each other on the bluffs near the east end of the dam. Since they are the subject of a report (Cumming, 1958) intended for publication, only summary treatment will be accorded them here. The occupation sites (14PO12, 14PO13) covered less than 2 acres of ground each, were quite possibly parts of a single community, and are suspected of dating from a relatively late period. Collections were made both on the surface and from shallow test pits; they included 25 objects, of which 11 were sherds, from 14PO12 and 244, of which 178 were sherds, from 14PO13. The sherds are all quite small, usually thin, and hard, with a dark-gray core and lighter surfaces; all contain minute particles of shell, often in abundance. Most are plain surfaced; but from each site there are a few which bear narrow deep punctates up to 5 mm. long, these presumably having occurred in groups or zones on the vessel surfaces. Trailed fine-line decoration is indicated as are handles and diagonally incised vessel lips. Chipped stone includes projectile points, a variety of scrapers, and miscellaneous cutting and chopping tools, nearly all fashioned from the local gray chert. Metal includes three sheet copper and iron scraps, of both surface and subsurface origin; and a heavy conical copper tinkler from one of the test pits. The metal, if actually inclusive, suggests a post-White dating; and the pottery complex and other objects seem to point in the same direction. The locality is well within the historic range of the Kansa and this tribe would appear to be a promising prospect in the search for the carriers of the complex represented. The basis for allocation of the sites is a slender one, however, and further work on the Kansa problem is needed before a convincing case can be made on archeological grounds.

The burial mound (14PO14) was an irregularly circular pile of limestone slabs and blocks about 1½ feet high and covering an area some 26 feet in diameter. Beneath it, southeast of the center, an elliptical pit had been dug 2 feet into the original ground surface. This measured 3 by 3.8 feet, the long axis east to west; and on the bottom lay the poorly preserved remains of three flexed adult burials. Accompanying the central one of the three, a male, were 8 beads of native copper, a small shell disk bead, and a large shell tube. Copper stains on both mastoid processes suggest that some of the beads had been attached to the ears; other copper bits and the shell tube were found near one wrist. Covering these three individuals was a layer of stones, on which were the crushed and disarranged remains of three more adults, all without artifact associations and covered in turn with some 12 inches of stone rubble. Five feet northwest of this pit, on the gravel at the base of the stone pile, was an extended skeleton, without skull or accompanying artifacts. It may have been an intrusive interment. Various stone artifacts were scattered throughout the mound fill, including stemmed, triangular, and one side-notched projectile point, scrapers, a catlinite pendant, pigment, etc. Some of these materials, such as the catlinite and the small side-notched point, suggest recency; they may have found their way into the upper mound fill long after the structure was originally erected.

Here, as with the habitation areas just noted, the basis for cultural and chronological allocation of the burial mound and of the remains it was specifically designed to memorialize is an insecure one. Cumming suggests that some variant of the Woodland horizon is represented, and notes the wide variation in burial mound practices attributed to Woodland peoples in the general region. I am inclined to agree with this identification.

The limited Tuttle Creek salvage operations just reviewed strengthen my long-held conviction that a sustained program of archeological research in the Blue River valley would probably still be worth the effort. A great deal of material has doubtless been destroyed in the past century as a result of settlement and agricultural development, but much remains. There is evidence that the major ceramic traditions of the northeast Kansas region prior to circa 1800 are represented, from which a succession of semisedentary and in part semihorticultural occupancies may be inferred. We need more precise information, however, as to the time and manner of occurrence of the successive occupancies, the nature of the cultural inventories characterizing each, and their relationships to comparable materials in the Nebraska area toward which the Blue River drainage naturally leads. The presence of numerous nonpottery camp sites further suggests that here, as apparently in other stream valleys cutting the Flint Hills upland farther south, there may well have been a long earlier period of residence by hunting and gathering peoples who were perhaps related to archaic and other preceramic horizons of the Eastern United States. This problem, too, invites further attention locally. Clarification of the cultural sequence in the Blue valley and definition of the various complexes that were involved would undoubtedly throw helpful light on surrounding localities whose prehistory awaits examination.

### SITES NEAR NEODESHA, WILSON COUNTY

The presence of archeological materials of unusual interest in the vicinity of Neodesha was noted at an early date, as already indicated in a previous section of this paper. The principal site reported was an earthwork, or "fort," lying on the east bank of the Verdigris

River about 3 miles north of the city. Richey (1904 a, p. 136) recorded his observations here about 1903, pointing out that "lodge sites occupy a considerable area" near the earthwork and stating that a collection of Indian artifacts and white trade goods from the site had been deposited in the Kansas State Historical Society museum. He was of the opinion that the earthwork had been erected by white men, was not very old, and that it had been built while the nearby Indian village was occupied.

In the literature on Kansas archeology subsequent to Richey's time, I find no mention of the Neodesha materials; and there appears to be no record of any excavations in the earthwork or among the nearby mounds. Late in 1931, Thomas M. Galey, oil operator of Independence, Kans., took a lively interest in the site and sought to enlist professional cooperation in its systematic investigation. Galey wrote, among others, to Carl E. Guthe, then chairman of the National Research Council's Committee on State Archeological Surveys, describing the site in some detail, and furnishing stereoscopic photographs and carefully prepared sketches. Almost nothing remained of the earthwork by that time, owing to intensive farming and to erection of oil storage tanks on the spot. The data supplied by Galey, which appear to include the only photographs and sketches extant, eventually were transmitted to the Smithsonian Institution and, as MS. 1976, are now in the archives of the Bureau of American Ethnology. So far as I am aware, the comments by Richey and Galey, plus one or two newspaper accounts brought to my attention by Nyle H. Miller, Secretary of the Kansas State Historical Society, constitute virtually all the information we have today concerning what must once have been a site of primary archeological, and perhaps also historical, interest.

The earthwork or "fort," here designated Site 14WN1, was situated on a broad terrace, less than 3 miles north of Neodesha and a few hundred feet east of the Verdigris River. A section line road bisects the site of the feature; and in the unbroken strip at the south edge of this road, faint traces of the old embankment may still be detected. North of the road, terracing and farming operations have completely obliterated all aboriginal remains; and when I visited the spot in July, 1954, a small chert end scraper was the only surface evidence of former Indian activity that could be seen here. South of the road, where some of the oil storage tanks have now been removed and their fire walls graded down, may be seen another segment of the earthwork. This consists of a curving embankment perhaps 12 or 15 feet wide, about 12 inches high, and some 30 yards long; at either end it has been truncated by the tank farm development many years ago. Shallow trenches or borrow pits, about 12 feet wide by 10 to 15 inches deep, parallel this embankment on both sides, suggesting that the earth was scraped up from both directions to form the wall. North of this wall section and within what was presumably the horseshoe-shaped enclosure, close scrutiny of the disturbed ground reveals occasional small sherds, flints, old animal bones, mussel-shell fragments, and other debris evidently left by Indians. Southwest of the earthwork, on a slightly lower terrace extending west into a bend of the river, we were able in 1954 to detect faint elevations on which vegetation grew noticeably better than on the surrounding ground; on and about these spots we gathered sherds, flints, shell fragments, animal bone, and other debris suggestive of village site refuse deposits. This area carries the site designation 14WN2; but it may well have been directly associated with the earthwork when the spot was in use by the Indians.

Such evidences as are now visible, of course, give no adequate idea as to the original appearance of the earthwork; but Galey's unpublished notes, photographs, and sketches, based partly on his own observations and partly on statements by older residents of the nearby area, help to remedy this situation. Thus, according to an early newspaper account (Benedict Courier, Benedict, Kans., March 8, 1901)—

> the fortifications occupy about an acre of ground and are situated on a little knoll or slight mound. They now consist of two semicircular trenches facing the south, with a slight rise in the ground on the outside of them. The trenches are not continuous but are in irregular lengths. They are about 4 feet deep and 10 feet wide, and range from 50 to 100 feet in length. The outside trench is more nearly continuous in its circuit. In some of the trenches are the stumps of trees about 8 inches in diameter, cut down recently, and 3 or 4 young trees are growing at different points surrounding them, being watered by the water which stands in the trenches at times. The character of the soil is flinty and loose flints may be found there now, indicating that possibly the trenches may have been made by Indians searching for flints and grinding stones. Smooth stones of flint are to be found there yet.
>
> We have been told that there is another and smaller work east of this one, somewhere near Chetopa creek.
>
> Mr. Moulton, who lived west of the earthwork, says that it has not changed any in 30 years, and old Osage Indians that were there when he settled on his farm told him they had hunted over the ground for 50 years and it was the same when they first knew of it. He also stated that the Indians had no legends or knowledge of who its builders were.

According to Galey—

> the main works are in the form of a hairpin widened toward the ends. One side was 384 feet long, the other a little shorter, the U pointing west. The end of the U was 6 feet above ground line, the flanks were 4 to 5 feet, a trench running along the inside. Outside is a wide depression caused by removal of earth for the embankment. The trench was continuous except for a 12-foot interruption at 120-foot intervals. About 300 yards northeast was a trench 60

yards long, bar-shaped, and an equal distance northeast was a small horseshoe pointing NW [or northeast?]. To the south and west of the main fortification are a series of low elevations 2 feet high and from 15 to 30 feet across. In these elevations have been unearthed pottery, stone implements, and bones of animals. No stone implements have been found within the fortification. In these have been found parched corn, lead bullets, butt of a gun, sword hilt, Spanish coin of 16th century, etc.

Another communication from Galey quotes from a letter from a man "who first broke the earth on the site of the fort," as follows:

> It has been 27 years since I left there. . . I worked on the tank grade marked on the sketch I make for you of the earthworks as they were in 1871. Down the third plow depth we plowed through two piles of ashes and also plowed up what we called a skinning knife, just the metal part and part of the blade was rusted away. (This was on the village site and suggests the village was not prehistoric). My parents had quite a number of things that they had found at the fort such as pipes of different materials much like our crockery, without the glaze, arrowheads of different sizes, found a number of jug handles (pottery remains, all Indian remains). Also found two stones which we called grave stones about 16 inches long, 2 inches thick, and 4 inches wide, and tapering at both ends. There were no stones like them in that country which we knew of. There were four knolls around south of the fort that were full of animal bones, pieces of crockery, and arrowheads. Mr. Cave, to the north of us (his land covers fort site on north side of road) plowed up several round bullets like those used long ago.

From another informant, one "John Gillmore, who wrote in 1881," Galey learned further that—

> On the south side the trench is about 3 feet deep and has been 1½ to 2 feet deeper, and the enbankment outside and next to the trench is now from 1 to 2 feet high and 12 feet wide. Outside is a wide depression, probably caused by the removal of earth for the enbankment. The trench is continuous save for a driveway or undisturbed piece of ground 12 feet wide, every 60 yards. About 300 yards northeast was a small horseshoe with the toe pointing NW. This latter fortification is practically obliterated. To the south and west of the main fortification are many tumuli, now almost obliterated (lodge sites). About 100 yards of said fortification, and near the bank of the Verdigris River, human bones were dug up 20 years ago. The tokens of white occupation are parched corn, lead bullets, butt of gun, sword hilt, Spanish coin of 16th century, and the character of the trenches. . . .

Galey twice corroborates the observations of Gillmore and Richey relative to the smaller refuse-laden mounds nearby, in the following terms: "adjacent to these earthworks are the remains of many lodge sites, small circular elevations rich in pottery and flint remains . . . "; and again, "close by are the remains of a very extensive Indian village, many low circular hut-mounds rich in pottery remains, flint chips, and bones."

There are a few minor discrepancies and some ambiguities in these various accounts, but certain inferences seem warranted nevertheless. First, the general size, contours, and appearance of the principal earthworks, the so-called "fort," seem clear enough; and my observations on the ground confirm the existence of those remaining fragments which Galey reported in 1931. Secondly, there appear to have been a number of low mounds to the south and southwest of the main earthworks, and these evidently were littered with pottery fragments, flints, bone, and other vestiges of former Indian domestic and village activity. No such mounds are reported within the enclosure. Thirdly, the objects picked up from time to time on the site include metal goods of white origin, as well as Indian artifacts; but it is not clear whether these materials of diverse origin were mixed throughout the entire area or, alternatively, were partially or wholly restricted to one or another part of the site. Finally, it is of interest to note that the Osage, whose villages after the Civil War were located in the Verdigris drainage and who had dwelt on the Neosho 25 or 30 miles to the east for some decades previously, disclaimed any knowledge as to identity of the builders of the earthwork.

From Galey's data, in the archives of the Bureau of American Ethnology, there are reproduced herewith his sketch of the earthworks as they are thought to have appeared in about 1870 (pl. 93, *a*). The accompanying line drawing (pl. 93, *b*), also by Galey, shows the relationship of the surviving wall fragments to the tank farm structures and to the obliterated sections of the earthwork. The tanks shown on this map, immediately east and west of the earthwork fragment, had been removed when I visited the spot on July 23, 1954, and the fire walls surrounding them had been graded down and leveled. The fragment of wall, with bordering ditches, was still traceable.

Despite the reported abundance of pottery and other materials on and near the earthwork site, singularly few specimens seem to have reached any of the established museums in the State, or elsewhere. Of the collection Richey says was deposited at the Kansas State Historical Society, only four pottery fragments are now available; no other aboriginal materials and no trade objects can be traced. On my visit of a few hours at the site, only a handful or so of aboriginal objects could be found. Some of these were found within the area presumably once enclosed by the larger U-shaped earthwork, in the area between the two former tank sites. Others came from a field to the southwest, probably in a part of the mound-covered area identified by Galey as the village site. Although extremely limited in quantity, the materials in both samples are of great interest; and they seem particularly suggestive when certain historical data are taken into consideration.

My artifact sample from within the enclosure, site 14WN1, includes 19 sherds, 11 of them tiny fragments that reveal almost nothing as to the nature of the ceramic complex here. All, however, are clearly shell-tempered, and most have a mouse-gray paste; surfaces range from gray to buff and buff-orange. Two sherds are from rims with plain lip, one flat, the other rounded. One small sherd has what appears to be an incised line. There is no indication of handles, bases, or other structural features or specializations, and of course, no clue to the size and shape of the vessels. Stonework includes a single small unnotched triangular projectile point with slightly concave base, measuring 29 by 12 mm.; three end scrapers, two of which are of fusulinid chert; 11 other chips and flakes, among which are several containing fusulinid fossils and one or two of banded pink or gray chert; a flat rectangular shaped piece of sandstone, 65 by 45 by 17 mm., with a shaft groove on one face and several narrow sharpening grooves on the other face; a larger sandstone fragment, which looks like half of a broken mano, and bears numerous deep, narrow sharpening grooves on several surfaces; a small flat piece of quartzite, apparently shaped, with one flat grinding surface, suggesting either a broken small metate or a lapstone; and a fragment of heavy broken musselshell. Not saved were numerous fragments and slivers of weathered animal bone, bits of charcoal, and several cobbles that may have been carried onto the site by Indians, but lacked definite evidence of workmanship. Nearly all of this material was found just south of the section line road and north of the remaining segment of earthwork; but since it occurred at and near the edge of the graded firewalls, its original provenience remains uncertain.

Other materials came from the almost indistinguishable elevations southwest of the earthwork, in what I think was very likely the village site mentioned by Galey. Here, despite the dry and unsatisfactory condition of the ground, we collected 12 sherds and a few stone artifacts. All the sherds were shell-tempered, closely resembling in color, texture, and other particulars those from the enclosure. There is one straight vertical rim piece with finger-impressed lip decoration and simple stamped exterior surface. Simple stamping appears on one other sherd; otherwise, surfaces appear to be plain and unmarked. Again there are no handles, basal fragments, or other structural features present. With regard to stone artifacts, there is one purple-gray unnotched triangular projectile point, 23 by 14 mm.; two small shaped sandstone fragments that may be ends of shaft smoothers; four end and two side scrapers; three spalls with retouched edges; and five or six miscellaneous chips and flakes. About half the chipped specimens are fusulinid-bearing, or else show the red or gray banding noted in many central Kansas chert artifacts, and I suspect this material is from the aboriginal quarries in the Florence flint horizon in the Maple City, Kans.-Hardy, Okla. locale.

Four sherds in the Kansas State Historical Society museum, bearing the catalog number 37304, are credited to Richey. One of these is not certainly aboriginal; it is very hard and heavy, and suggests stone or mortar rather than a native product. The other three pieces are all vessel handles; all are brown in color and heavily shell tempered. In form, the handles are wider at the top where they join the vessel rim than at the bottom; two were certainly tenoned into the vessel wall at the lower end. In two, the vessel lip is plain; the third carries shallow notches at intervals of about 3 cm. One piece has broad vertical simple stamping on the neck zone under the handle. There is no information as to where on the site these pieces were found.

The elevations at 14WN2 also contained some white material, including crockery, glass, and occasional metal. What we saw of this was unquestionably late, presumably dating from modern farming, oil drilling, and other operations. We found nothing that suggested 18th century or older trade materials.

Cultural allocation, chronological placement, and tribal identification of the Neodesha site, or sites, is manifestly impossible on the basis of the very scant data now at hand. Whether further investigation, including systematic excavation, would add materially to the data, I cannot say; the extensive disturbance by heavy farming and industrial development, coupled with unsatisfactory surface-hunting conditions at time of my visit, left me with a rather unfavorable impression in regard to future prospects. The locality is, however, a strategic one from the standpoint of tribal movements in early historic times; and since virtually nothing is known regarding its archeology or its native history in early white contact days, some further search would seem justified.

On the basis of my limited observations, I am inclined to think that Galey and his predecessors were correct in arguing that the Neodesha earthwork and its nearby mounds, almost certainly middens, represented the location of a sizable Indian community. If the metal goods reported were indeed associated with the native materials, the seeming predominance of shell-tempered pottery becomes a significant fact. There are several archeological complexes with shell-tempered pottery in the southern Kansas-northern Oklahoma-southwestern Missouri region, including both pre-White and post-White time horizons. Among the latter, the Lower Walnut Focus materials near Arkansas City, Kans., and the Chilocco Historic materials in Kay County, Okla., immediately come to mind. For both complexes a Wichita authorship has been suggested—the Chilocco materials probably dating from the first half of the 18th century, the Lower Walnut materials perhaps preceding these by a century or more.

The former are associated with abundant trade goods, the latter with relatively limited amounts or none. The Neodesha materials, if we accept early-day reports, included White goods in some quantity; and I would be inclined to guess that they perhaps correlate more closely with the Chilocco complex than with the Lower Walnut Focus.

The possibility that there was in the early 18th century a large community of Indians in the present Neodesha locality, manufacturing shell-tempered pottery and in contact with white men, has interesting historical implications. In 1719, DuTisné reportedly traveled 4 days, or 40 leagues, southwest from the Osage villages in present Vernon County, Mo., to a "Panis" or "Panioussa" (Wichita) village. En route, says La Harpe (Margry, 1886, vol. 6, p. 311), DuTisné crossed four streams, three of them inconsequential tributaries of the Osage River. The fourth and largest was the "Atcansas," and 12 leagues beyond was the village on the bank of another stream; a league to the northwest, on the same stream, was another village as large as the first. Each village was said to have 130 houses and 200 warriors; and the two had 300 horses. Various locations have been suggested for these villages, including the Neosho valley near Vinita, Okla., and the Arkansas valley in Kay County, Okla.

The Neodesha locale is about 85 miles airline southwest of the Osage sites in Vernon County, Mo. To reach it in 4 days, DuTisné would have had to travel about 20 to 22 miles daily; he would have crossed creeks tributary to the Osage and finally the largest stream, the Neosho, about 20 to 25 miles east or northeast of present Neodesha. To reach the Vinita locality, he would have had to travel mostly south from the Osage villages, and the daily marches would have been at least 25 to 30 miles. To reach the Kay County sites, which are probably chronologically acceptable, he would have had to travel not less than 150 miles, or a highly improbable average of 40 miles or more per day; and he would have crossed the Neosho, the Verdigris, probably Fall River and Caney creeks, and perhaps other south-flowing streams that he could hardly have mistaken for tributaries of the Osage. In short, the Neodesha sites seem to fit the geography and also the distances and directions supposedly traveled, provided it can be assumed that the French mistook the Neosho for the "Atcansas"; and a shell-tempered pottery complex would be a probable one for a Wichita community of this period. The Kay County sites seem much too far away; and the Vinita locality, aside from the difficulties raised by distance and direction, has not yet produced White contact Indian sites that might be of the period demanded.

For reasons that must be obvious, I do not press the correlation here suggested; but I am inclined to think that further archeological and ethnohistorical studies might profitably be pursued in connection with the problem. If a protohistoric village site of such size actually existed here, and if it can be linked up with early French contacts in the region westward from Missouri, it seems probable that the Verdigris, and perhaps also the Neosho, 25 miles to the east, may have to be considered as lying within the early 18th century country of the Wichita Indians.

The Galey correspondence also makes mention of another site, about 3 miles to the southwest of the earthwork, on the left bank of Fall River. This "consists of three great circular excavations which are closely adjacent to each other, the diameter of each circle being about 75 feet, each circle being connected by a deep 'drain' which leads into a very deep common drain to a deep bayou adjacent. The centers of the circles have not been excavated. The excavation which makes the circles is about 5 feet deep, the common drain is 12 feet deep, the drain into the bayou is 15 feet deep, which is the same depth as the bayou, which was probably a means of escape." There is no mention of any artifacts from this curious feature; I have not seen it and can offer no further comment regarding its appearance and nature.

## CLASSIFICATION OF SITES

The cultural affiliations of the various Kansas sites described in the foregoing pages have been indicated in most cases in the relevant sections of this paper. The allocations are brought together and summarized in table 18, which groups the sites according to their apparent relationships to one another, and further undertakes to correlate them with larger categories represented by other sites previously classified in the Central Plains. I have included in this table a few Kansas sites that were not investigated by the United States National Museum, but whose relationships are directly relevant to the present problem.

Some of the correlations indicated have been known, of course, to Plains archeologists for a good many years. It is not news, for example, that the Fanning site is Oneota or that "El Cuartelejo" is Dismal River. The Kansas Monument site has long been recognized as Pawnee, the Manhattan and Doniphan sites as Kansa. The sites grouped within the Great Bend Aspect include the six described in some detail in this report, on which the aspect and its two presently recognized foci—Little River and Lower Walnut—have been set up. Allocation of the Warne site (14JW1) on White Rock Creek and of Glen Elder (14ML1) to the Glen Elder Focus follows a suggestion by Smith (1949 b, p. 6); further assignment to the White Rock Aspect (Rusco, MS.), along with the Blue Stone Focus in Harlan County, Nebr., reflects my view that these are *not* Oneota, though they clearly share some traits with that aspect.

TABLE 18.—*Suggested classification of some Kansas sites*

| Component | Focus | Aspect | Phase |
|---|---|---|---|
| 14DP1 (Fanning) | Wolf Creek | Oneota | Upper Mississippi |
| 14JW1 (Warne)<br>14ML1 ("Beloit 2") | Glen Elder | White Rock | |
| 14RC8 (Tobias)<br>14RC9 (Thompson)<br>14RC5 (Malone)<br>14RC3 (Hayes)<br>14RC2 (Major)<br>14MP1 (Paint Creek) | Little River | Great Bend | |
| 14CO1 (Larcom-Haggard)<br>14CO2 (Elliott)<br>14CO3 (Ark. Cy. Ctry. Club) | Lower Walnut | | |
| 14SC1 ("El Cuartelejo") | Scott | Dismal River | |
| 14LA1 (Pottorff A) | | Upper Republican | Central Plains |
| 14RY1 (Griffing) | Manhattan | Smoky Hill | |
| 14SA1 (Whiteford)<br>14OT5 (Minneapolis) | Saline | | |
| 14DP2 (Doniphan (early component)) | | Nebraska | |
| 14PH4 (Woodruff)<br>14LA1 (Pottorff B)<br>14SC2 (Young burials) | Keith<br>(?)<br>(?) | Orleans<br>(?)<br>(?) | Plains Woodland |
| 14WY1 (Trowbridge)<br>14PO25 (Brous)<br>14PO26 (Dike) | Kansas City<br>(?)<br>(?) | | Hopewellian |

*Historic sites with tribal identifications*

14RP1 (Kansas Monument site)—Pawnee, pre-1800
14PO24 (Manhattan; Blue River)—Kansa, ca. 1800–30
14DP2 (Doniphan late component)—Kansa, ca. 1724

*Unclassified sites* (*see text*)

*Ceramic*

14PT1 (Pratt)
14SC4 (Risston; multicomponent?)
14LA2 (Walter; multicomponent?)
14CS1 (Roniger; multicomponent?)
14WN1/2 Neodesha "fort"
Younkin mound

*Nonceramic*

Lansing Man
12-Mile Creek
Flint Hills chert industry
Smith County

With respect to the Central Plains Phase of the table, I have elsewhere herein recorded my view as to validity of the categories long ago designated the Upper Republican and Nebraska Aspects. I suspect, moreover, that a third category of the same order will prove useful in considering widespread prehistoric remains in Kansas that are basically related to these two but also show some apparently consistent variations. Accordingly, I have proposed the Smoky Hill Aspect, which includes at present two foci—Manhattan and Saline.

The provisional character of the proposed classification, based as it largely is on limited excavation and small samples, is evident particularly in the Plains Woodland and Hopewellian groupings. There is no question that Occupation B at Pottorff is Woodland in nature, but its equivalence to the Keith Focus represented by Woodruff ossuary (Kivett, 1953) is not conclusively demonstrated. Likewise, the very small artifact series from the Young burial site permits, at most, the suggestion of a Woodland context. As regards Hopewellian, the Trowbridge site is certainly to be so classed; the Dike and Brous sites require further investigation before their cultural affinities can be finally decided.

The unclassified sites are so grouped for various reasons. Several of those listed as "Ceramic" appear to have been originally multicomponent, perhaps including both Woodland and later manifestations. For the Pratt site, there are strong indications of connections with late prehistoric complexes in central Oklahoma; but in the absence of excavated data, I have felt that allocation was premature. The "Nonceramic" sites similarly suffer from lack of data; most are probably preceramic.

The section that follows undertakes to summarize and describe the aspects to which the various sites have been assigned in table 18. By this means I hope to make clearer what I regard as the position of the sites in the present picture of Central Plains prehistory.

## SUMMARY OF CULTURES REPRESENTED

### PRECERAMIC MATERIALS

Almost nothing is known regarding the prepottery archeological remains of Kansas. That such materials exist, and probably include vestiges of Early Lithic or Paleo-Indian occupations, is an entirely reasonable inference. The only record of association of an artifact with extinct animals—a projectile point with several skeletons of *Bison occidentalis*—is that by Martin and Overton (Williston, 1902 a) near Russell Springs. More recently, there have been surface finds in various sections of the State that point similarly to early occupations. Although no fieldwork along this line was attempted by the National Museum parties of 1937–40, some information worth recording was acquired incidentally and more has since come to my attention.

During our 1939 investigations in Scott County, collectors from various communities in western Kansas brought into camp samples of the materials they had picked up in wind-stripped fields during the protracted drought then drawing to a close. Among these materials, which included many Woodland and later types of chipped artifacts, a number of fluted and lanceolate points were noted. We were told that Folsom fluted pieces were most frequently found south of the Arkansas River, but occurred also north of that stream to the Nebraska line and west to Colorado. No locality of especial abundance, however, was reported to us. The only fluted point materials from Kansas in the national collections are two or three Folsom-like fragments, including a base, from the vicinity of Liberal (pl. 15, and fig. 96, *a*, *b*).

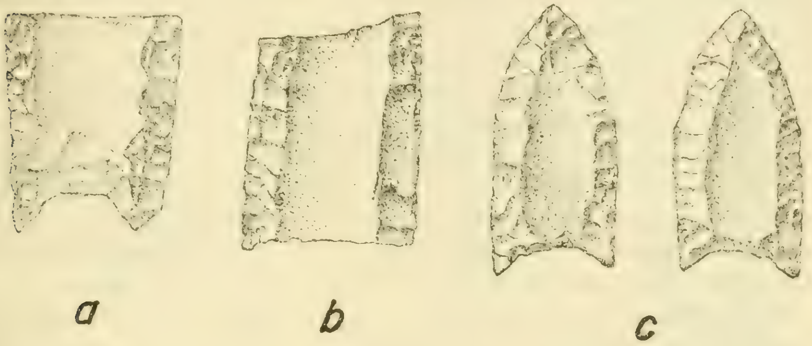

FIGURE 96.—Fluted point (*c*) from Doniphan County and fluted point fragments (*a*, *b*) from Liberal, Seward County. (*c*, By courtesy of Forrest Acker, Leona, Kans.)

More recently, an interesting series of points from northeastern Kansas was submitted for examination to the National Museum by Mr. Fenn Ward of Highland, and others. They include (pl. 15) a large specimen of Eastern fluted (*f*); several smaller ones (*h*, *i;* and fig. 96, *c*), with finely retouched edges, that strongly suggest Folsom fluted; and several other lanceolate, unfluted or basally fluted pieces (*e*, *j*). Several are, in form, within the range of Plainview points. There are some features slightly reminiscent of specimens from the lower levels of Graham Cave (Logan, 1952, pl. 4, 5); or perhaps the group, aside from the Eastern and Folsom fluted pieces, should be said to have a Plains Archaic look. At any rate, they are wholly unlike any points I have ever seen from the ceramic cultures of Kansas. In all illustrated pieces retaining the base, this has the lateral edges blunted, in which feature they again differ from the points with pottery associations. It is perhaps worth noting that the district from which these objects were collected—Atchison, Brown, and Doniphan Counties—is approximately 50 miles east of the Tuttle Creek reservoir area from which Solecki (1953 b, p. 16 and fig. 6) reported a Folsom point and the basal portion of a Plainview. Northeastern Kansas may thus be expected to produce further, and perhaps more substantial, evidence of preceramic cultures of considerable antiquity.

Probably later in time are the remains briefly reported (Smith, 1938; Eiseley, 1939) from Smith County, in north-central Kansas. Here, flakes, scrapers, charcoal, and a single point, described as non-Folsom in type, were found at a depth of 10 feet underground in a stream terrace. From the geomorphic evidence, a post-Folsom dating is inferred, with the age presumably measureable in terms of several thousand years. I know of no subsequent investigations at the locality.

Another mass of materials that I have finally come to believe may be, after all, fairly early in the State is the heavy flint industry formerly found around Manhattan and elsewhere in the lower Kansas River drainage where this cuts through the Flint Hills upland. This includes the "paleoliths" of Winchell, and also a strange and varied assortment of large blades, double-bitted coarsely flaked choppers, spadelike and chisellike forms, thick curved pieces, a variety of stemmed and corner-notched projectile points, massive reamerlike objects, drills, and other items. The range in form and size, and the massive nature of many of the pieces, can be judged from the illustrations in Brower (1898, pls. 3, 4, 10, 11, 13–15, 22; 1899, passim), in Winchell (1913), and from figures 97–99 of the present paper.

Most of these materials, so far as I can judge, have been surface finds; and in Brower's time, they were evidently present by the thousands. I once thought that this was essentially quarry material and rejectage of manufacture, and some of it may well be. Repeated examination of specimens in the national collections and of the numerous published illustrations by the above-mentioned authors, however, has convinced me that there are a great many crudely retouched and finished artifacts among them. The chipping is coarser, often markedly so, than that on points and blades of the ceramic cultures. Many of them are heavily patinated, sometimes differently on various surfaces. Moreover, although somewhat similarly shaped objects occasionally turn up in or on village and campsites of the pottery period around Manhattan, they are not present in the numbers one would expect if these communities were their principal destination. In the localities and on sites where these materials are most plentiful, pottery is scarce or absent. They are made from the cherts locally available in unlimited quantities; yet there are no known aboriginal workings from which such materials might have been quarried in the amounts indicated. If they represent workshop debris, where did the finished products go?

The points, mostly stemmed in a variety of shapes (see for example, fig. 99; Brower, 1898, pls. 3, 4, 10; Winchell, 1913, pls. 14, 19), are not at all like the Plains Archaic specimens from northeastern Kansas. They look eastern rather than western, and seem strangely out of place when considered in relation to the usual run of specimens from the Woodland and later pottery cultures of the Central Plains. There are a few vague resemblances to Grove Focus points in northeastern Oklahoma (Bell and Baerreis, 1951, pl. 1); how far these resemblances may extend to other artifact types, I am not prepared to say. From their rather striking dissimilarity to the stonework from

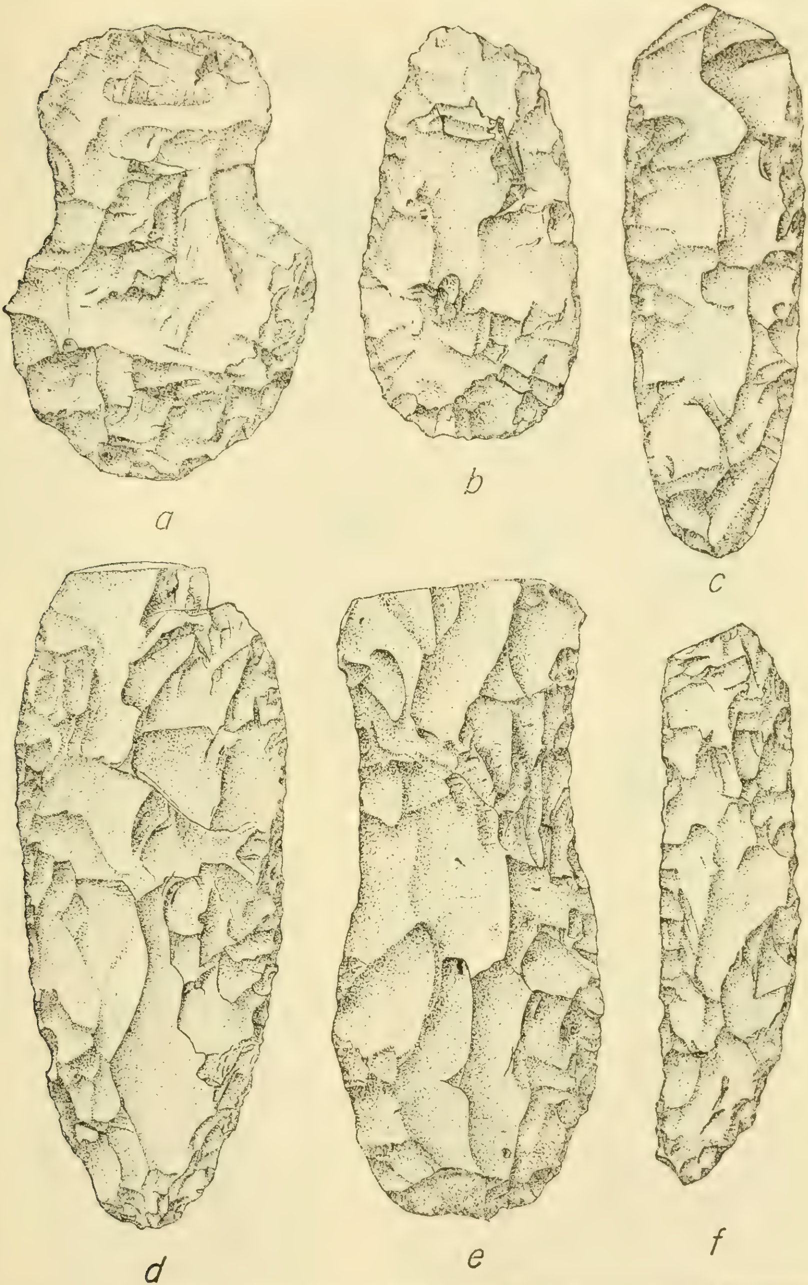

FIGURE 97.—Heavy chipped stone artifacts from Kansas River valley, vicinity of Manhattan. Length of *d*, 18 cm.

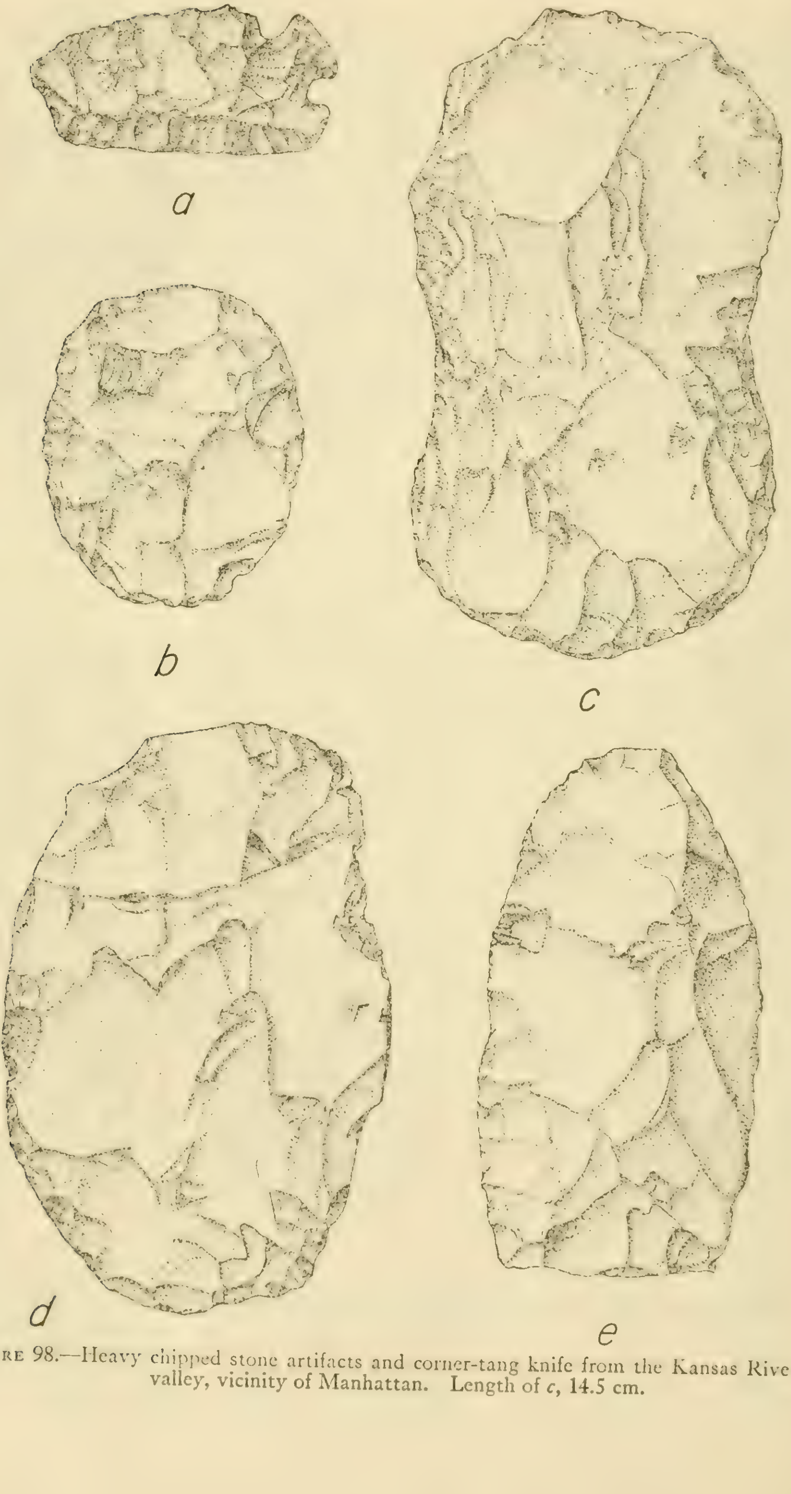

FIGURE 98.—Heavy chipped stone artifacts and corner-tang knife from the Kansas River valley, vicinity of Manhattan. Length of *c*, 14.5 cm.

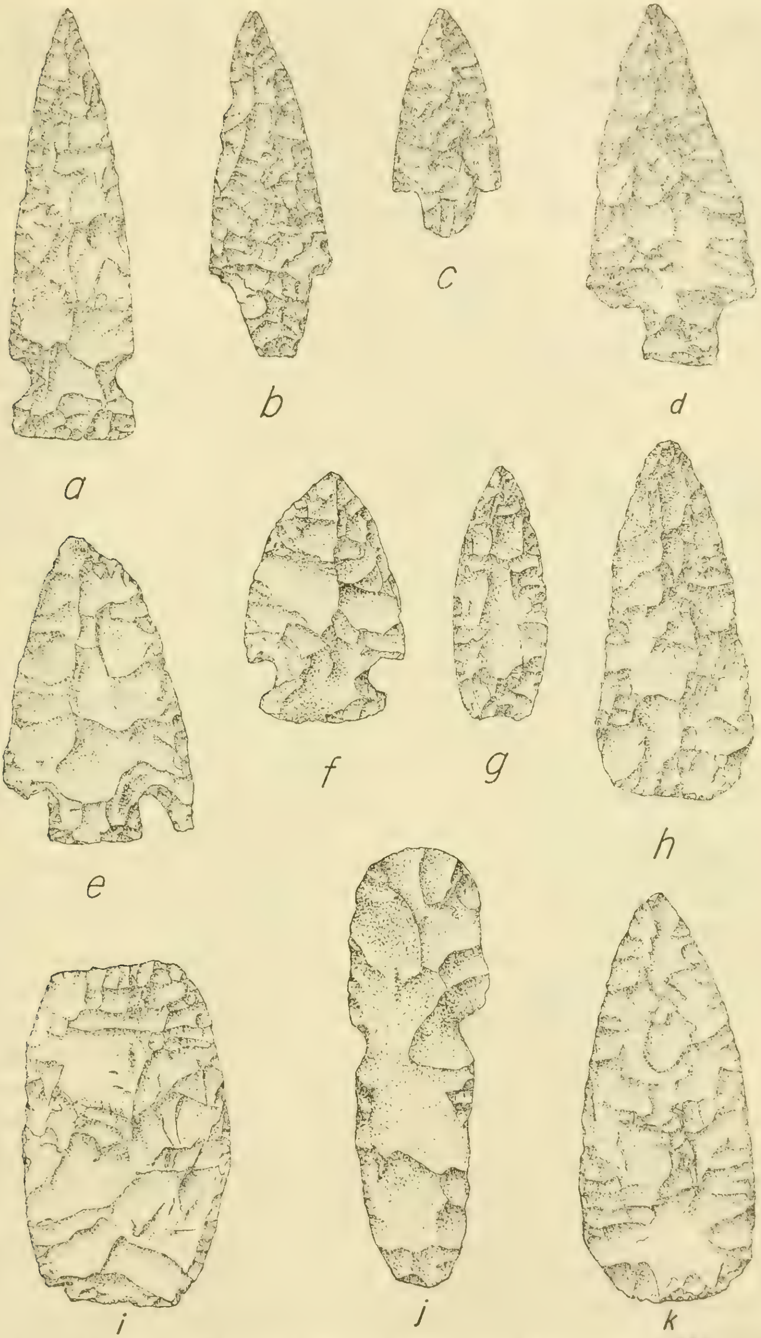

FIGURE 99.—Chipped stone artifacts from the Kansas River valley, vicinity of Manhattan. Length of *a*, 10 cm.

village and burial sites of the Central Plains pottery cultures, the apparent absence of any demonstrable pottery associations, and the general character of the remains, I suspect that these materials may represent an Archaic or Early Woodland level, probably with eastern connections, and so are later in time than the fluted and lanceolate points found in northeastern Kansas and elsewhere in the State. Further investigation of this problem would be in order.

## THE WOODLAND COMPLEXES

Widely distributed remains of diverse nature characterize the Woodland period in the Central Plains. It has long been evident to Plains archeologists that these were the earliest pottery-bearing cultures in the region; and the results of systematic excavation have shown that Woodland peoples were also the first to practice maize horticulture here. For the most part, the Woodland sites are small in area, their yield of artifacts scanty and unspectacular; and so, they have received much less attention than the later, larger, and more prolific sites. Within the past two decades, however, sufficient evidence has accumulated to give some important insights into the Woodland occupation of the Central Plains.

The 1937–40 field operations of the United States National Museum in Kansas touched all too lightly on the Woodland problem. It was, however, not entirely neglected. Sherds, projectile points, grooved stone axes, and other materials certainly or probably attributable to a Woodland occupation were noted in a number of localities. These were especially common in the northeastern part of the State (fig. 100). Here, centering around the junction of the Kansas and Missouri rivers, clear evidence was found that Hopewellian peoples were once established in a number of settlements. In bluff top locations farther north, low earthen mounds covering shallow basins containing fragmented and scorched human bones, but little else, are tentatively ascribed to some as yet unidentified Woodland group. Sporadic finds of heavy cord-roughened sherds have been reported in central and southern Kansas. The National Museum excavations in Lane and Scott Counties reported herein have extended the known distribution well into the western part of the State; and the River Basin Surveys investigations near Woodruff on Prairie Dog Creek carry it northward toward the Nebraska area.

Since the known Kansas materials show definite relationships to the better-documented Woodland complexes in western Missouri and in Nebraska, a review of the principal variants involved in these areas is desirable.

Probably the most advanced and complex of the Woodland manifestations of the Kansas region is the Hopewellian. The results of

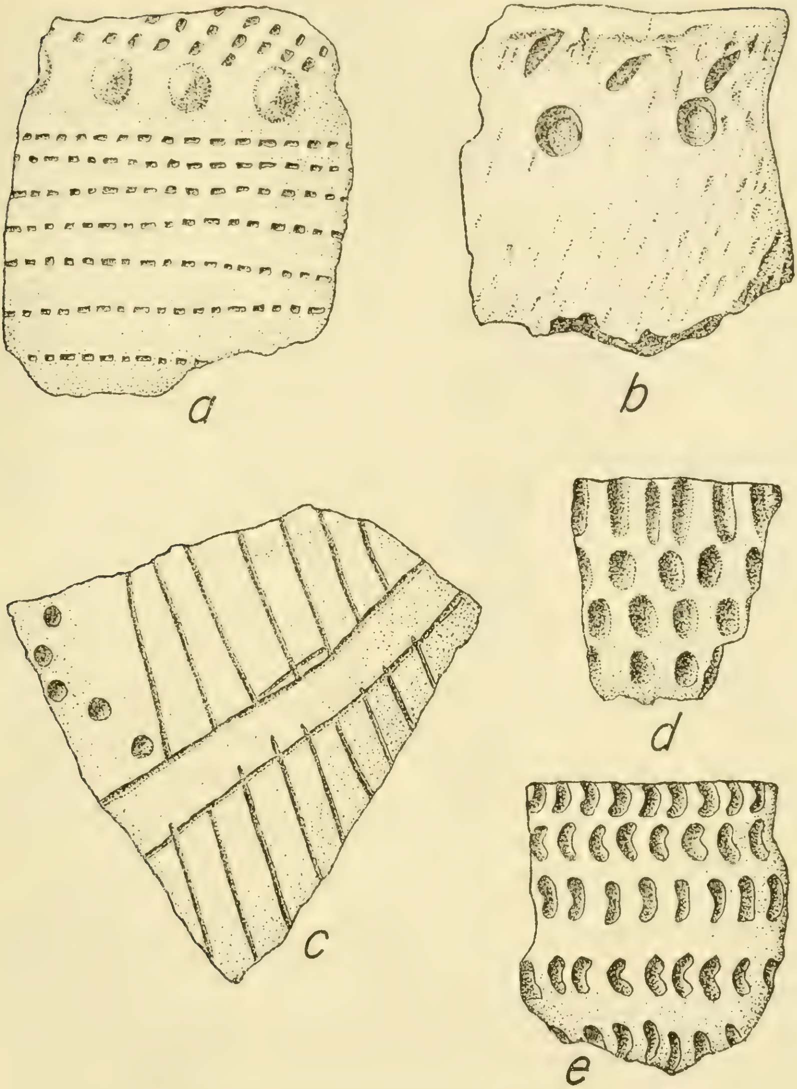

FIGURE 100.—Miscellaneous sherds from Wyandotte County.

excavations by the United States National Museum at the Renner site, a Hopewellian settlement, and in related chambered burial mounds nearby, in Platte County, Mo., have been reported at length in another place (Wedel, 1943). It was pointed out there (ibid., pp. 98–103, and fig. 1, sites 1–4) that related materials occurred at several locations in northeastern Kansas. The best represented of these, and probably the most important of which we now have any record, is the Trowbridge site near Bethel; others are known on Plum

Creek north of Leavenworth, in Klamm Park and at 9th Street and Chelsea Trafficway, Kansas City, and on a small creek near Edwardsville. I have reexamined none of these localities since our 1937 investigations; and for the most part, they are now either destroyed or else have yielded too little material to permit satisfactory definition of the complex to which they belong. Through the courtesy of H. M. Trowbridge, however, I have been privileged to examine several times an extensive collection he has gathered over a period of years from the site near Bethel.

The Trowbridge village site 14WY1, now largely destroyed by construction work, occupied some 3 or 4 acres on a sheltered small-creek terrace. Cultural materials occurred in a dark, refuse-laden soil stratum 12 to 18 inches thick and overlain by up to 2 feet of slope wash. Trash-filled (cache) pits like those at the Renner site were present, but there were no traces of post-molds, hearths, or house outlines. No beans, maize, or squash remains were noted during the digging; but the first two were found at the Renner site and were, in all probability, known also to the inhabitants of the Trowbridge site.

The pottery remains, which occurred in abundance, have not yet received the careful analysis they merit. It is clear, however, that grit-tempered wares with plain, rocker-roughened, cord-roughened, and rare rouletted surfaces are predominant. There are no complete vessels; but a large jar, vertically elongate, with slightly constricted neck and wide mouth, appears to have been a common shape (see Wedel, 1943, fig. 4, *j*). There is evidence of smaller quadrilobate vessels also. Other forms can probably be determined or reconstructed from the extant sherd materials. Dentate and complicated-stamp impressions occur frequently on body sherds; and these, like the rocker roughening, were sometimes arranged in alternate plain and stamped zones separated by incised lines or broad grooves. Cross-hatched rims seem rather less common than at Renner; other types include punched bosses, alone or with cord-wrapped stick or dentate stamp impressions above on the rim exterior. Generally speaking, rim form and decorative treatment parallel those at Renner. In addition to vessel fragments, pottery remains include crude clay figurines such as bird effigies, a small nipplelike object, and a human bust (?); and there is also a fragment unmistakably from the bit end of a clay platform pipe (fig. 102, *h*). A selected series of sherds and other pottery items in the Trowbridge collection from this site is shown in figures 101 and 102.

There is also a varied and considerable series of nonpottery materials (see fig. 103). Chipped stone includes numerous large stemmed or corner-notched projectile points, and lesser numbers of scrap-

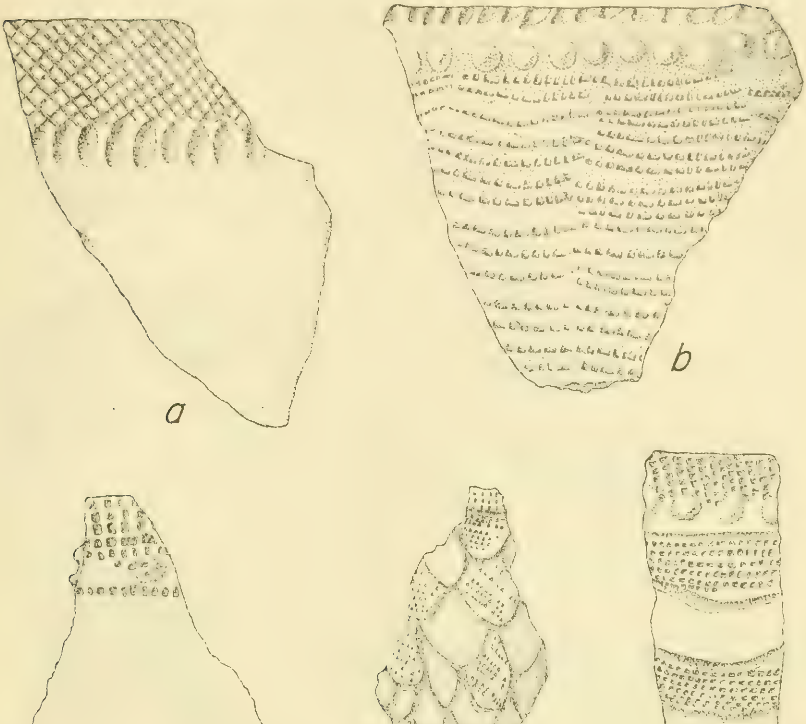

FIGURE 101.--Dentate-stamped, zone-decorated, and other sherds, Trowbridge site, 14WY1.

ers, disks, drills, flake and other knives, and one flake of worked obsidian. The three-quarter grooved ax, of which several were found at Renner, has not been reported from the Trowbridge site; but there is a polished hematite celt, along with stone pendants, gorget fragments, sandstone abraders, and worn and grooved pumice

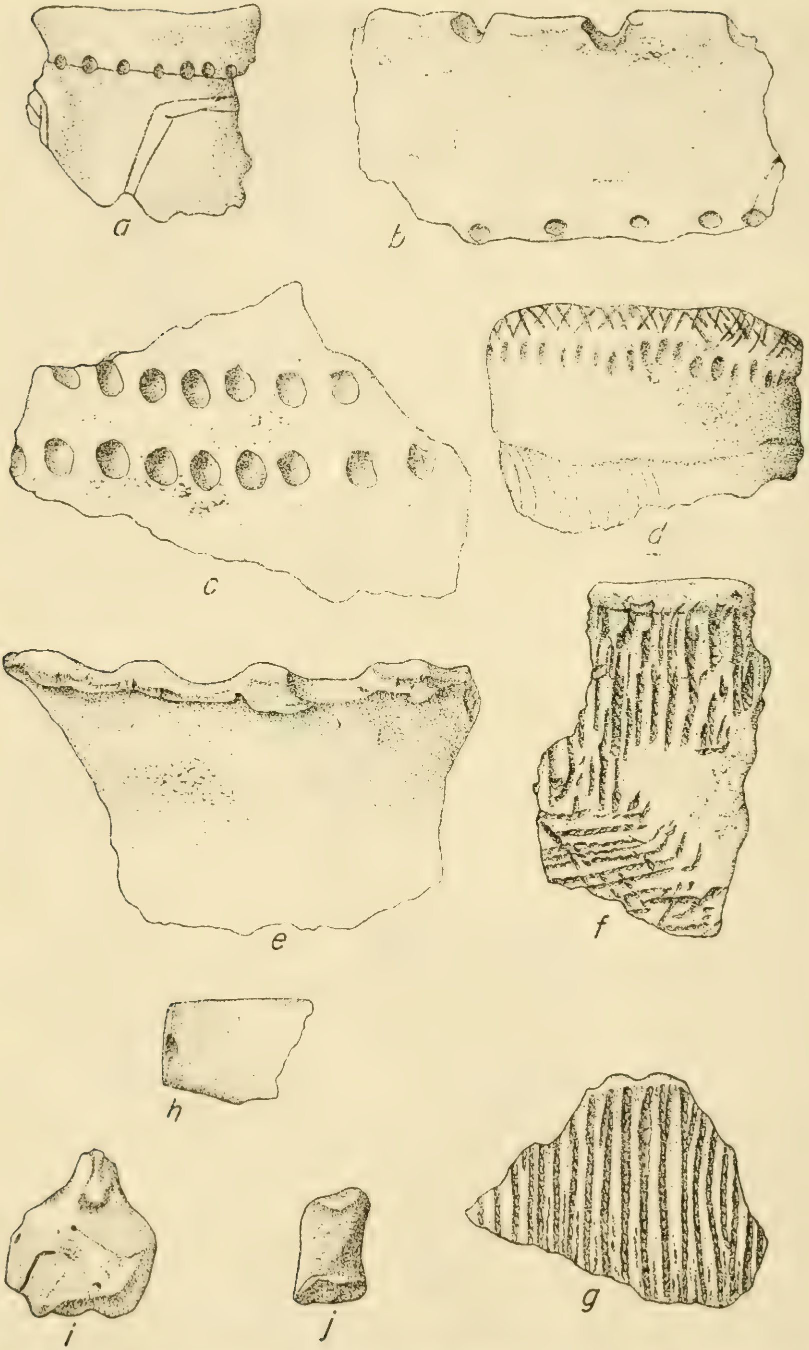

FIGURE 102.—Miscellaneous sherds, clay pipe stem fragment, and crude effigies, Trowbridge site, 14WY1.

lumps. Present also are conical socketed projectile points (fig. 103, *d*), flakers, cylindrical rubbing tools, and a small dentate roulette (Wedel and Trowbridge, 1940) for marking pottery (fig. 103, *e*), all of antler; and beaming tools of split deer metapodials (fig. 103, *a*) and innominates, mammal bone awls, and ulna punches. Two fragmentary, but worked, turtle carapaces suggest bowls or dippers.

No burials have been found at the site. Across the Missouri, there is evidence that small mounds containing square dry masonry chambers are assignable to the local Hopewellian complex, and perhaps earth mounds as well. There are a few chambered mounds on the Kansas side of the Missouri (Wedel, 1943, p. 159), but these, like Hopewell village sites and sherd areas, have not been reported north of the Nebraska-Kansas boundary.

The materials from the Trowbridge site parallel, in general, the assemblage found at the Renner site, 5 or 6 miles distant; and there is no doubt as to the close relationship between the two, or of their basic relationship to Hopewellian culture. They are clear evidence that Hopewellian communities of some size and permanence were established in the trans-Missouri region. How far westward the Hopewellian occupation extended is not yet clear. Evidence of it has been recognized up the Kansas River valley in the vicinity of Wamego; in burial mounds and habitation areas near Manhattan at the mouth of the Blue; and at the Younkin mound (Schultz and Spaulding, 1948) in Geary County on the lower Republican. The relationships of the Kansas River materials to those around Kansas City still await clarification; but the Younkin mound, and probably some of the lesser tumuli briefly described in the present paper from the Manhattan locality, suggest important differences (see also Eyman, MS.).

Hopewellian materials have been found in what may be a small occupational area in Ellsworth County (Smith, 1949 a, p. 297); and, in the form of a rocker-roughened sherd, in the Woodland level at the Pottorff site on Salt Creek in Lane County, yet farther west. Almost nothing is known of the distribution south of Kansas River; but there are dentate-stamped sherds with zoned decoration from the Cottonwood valley near Marion and again near Bazaar. There is also some evidence of former stone-chambered burial mounds in the Marion locality. I have unconfirmed verbal reports of Hopewellian potsherds from south-central Kansas in the Arkansas-lower Walnut drainage, and have seen dentate-stamped sherds from the vicinity of Independence. It seems likely that additional such materials will be recorded in time from the Neosho and Verdigris drainages, where connections between the Kansas City district and the Delaware County, Oklahoma, Hopewellian locality (Bell and Baerreis, 1951, p. 27) may be expected.

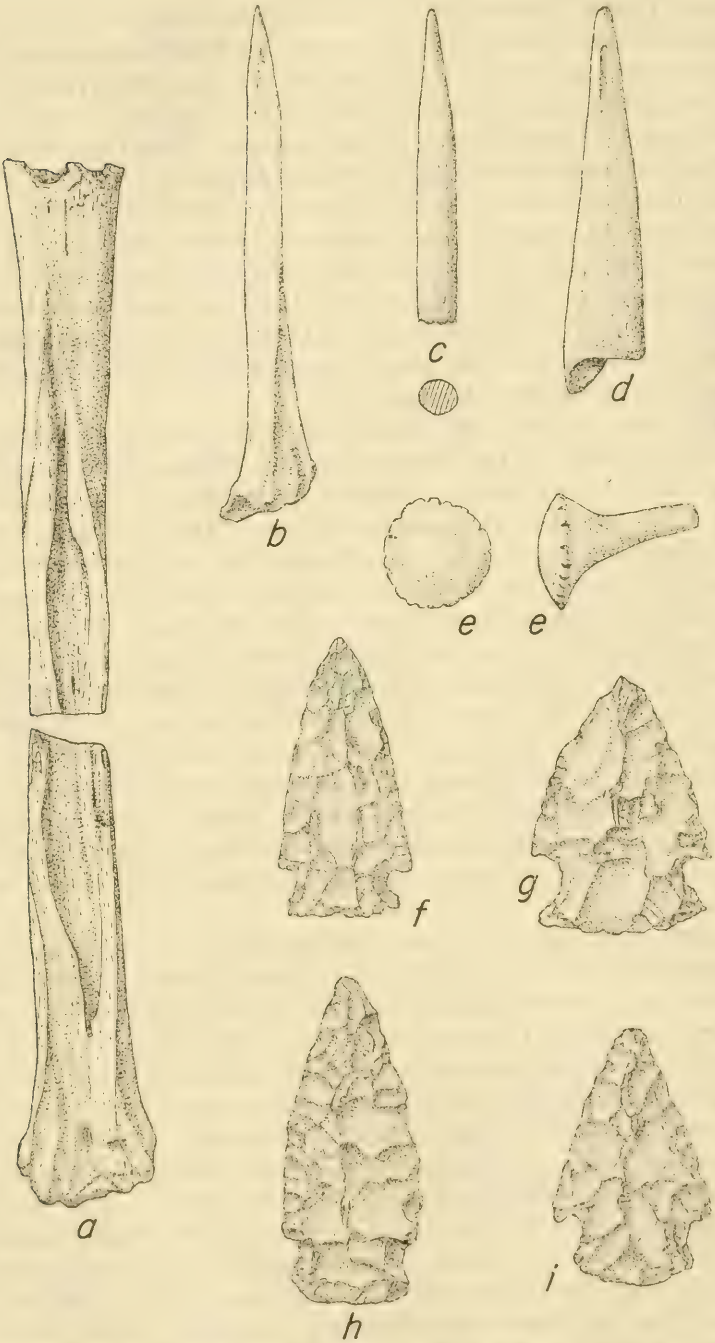

FIGURE 103.—Miscellaneous artifacts of bone, stone, and antler, including roulette for pottery marking (*e*), from Trowbridge site, 14WY1.

No Hopewellian village or burial sites have been reported from Nebraska; but the presence of a few rocker-roughened body and cross-hatched rim sherds in an otherwise dissimilar Woodland pottery complex near Peru (Hill and Kivett, 1941, p. 198) should be noted. Along the Missouri River and on tributary creeks in the southeastern part of Nebraska, there are other remains assignable to the Woodland period. First of these to be recognized by a name, and one of which some traces might be expected in northeastern Kansas, is the Sterns Creek culture (Strong, 1935, pp. 175–198; Champe, 1946). This is best-known from the Walker Gilmore site in Cass County, the only location from which any appreciable amount of excavated material is available. Here numerous hearths, ash lenses, and other remains occur at depths up to 27 feet beneath the ground surface, and for some hundreds of yards along the course of the creek. Small post molds and masses of grass suggest the remains of pole and thatch dwellings, of an Eastern Woodland type. There are abundant remains of the bush summer squash and the bottle gourd, but none of maize or beans. Bone refuse includes many remains of deer, small mammals, and birds, few of bison. Worked bone consists of numerous eyed needles, awls, a few tubes or beads, a longitudinally perforated deer-toe bone, antler flaking tools, and picks. Worked stone is not plentiful; it includes roughly fashioned knives or picks, hammerstones, a polished celt or ax fragment, and crudely chipped notched and unnotched projectile points. Pottery is grit tempered and usually smooth surfaced, but with some sherds that suggest straw roughening. Small to medium-sized vessels are indicated, apparently with more or less conical base, vertically elongate shape, slightly to strongly constricted neck, and simple rims. There is little or no decoration beyond scalloping or incising of the rim exterior and occasional single-cord impressions on the rim or neck. Clay pipes, presumably of straight form, are indicated.

The geographic range of Sterns Creek culture is very incompletely known, but recognizable remains of this sort do not appear to have extended very far westward from the immediate valley of the Missouri River. Sherds regarded as assignable to this complex have been reported from as far upstream as Harrison County, Iowa (Keyes, 1949, p. 97) and downstream to Holt County, Mo. (Wedel, 1940 a, p. 305), the known north-south spread thus not much exceeding 125 miles. At the moment, therefore, this appears to be the most restricted areally of the known Central Plains Woodland complexes, as it is also ceramically perhaps the least representative.

Farther up the Missouri, and extending westward over much of northeastern Nebraska, is another Woodland complex of which no trace has yet been reported from Kansas. For this, the term "Loseke

Creek Focus" has been suggested (Kivett, 1952, p. 70), the name being taken from a small tributary of Shell Creek in Platte County, Nebr., where several village sites have been investigated. No house remains were identified, but small storage pits and hearths were present. Pottery is sand- or grit-tempered and predominantly cord-roughened. It is distinguished by frequent use of single-cord impressions on the rim exterior, these occurring as parallel horizontal lines, in triangular areas suspended from the lip or just below, as short diagonals on the outer rim edge, or in various combinations of these devices. Nonpottery traits were very poorly represented—a few chipped projectile points, end and side scrapers, blades, hammerstones, and choppers, and a little bonework. Of particular interest is the demonstrated presence of kernels of a "relatively primitive type of corn."

Pottery similar to the Loseke Creek ware has been noted in the Weeping Water valley in Cass County, in burial mounds on Eagle Creek in Holt County, along the Missouri River bluffs in western Iowa, and in South Dakota. In western Iowa, as the Missouri Bluffs Focus, this pottery is reported to occur stratigraphically above Sterns Creek and "Northern Woodland-Hopewellian" materials (Keyes, 1949, p. 97). In South Dakota, as represented at the Scalp Creek and Ellis Creek sites (Hurt, 1952), it appears to be associated with a more complicated and perhaps later manifestation than that reported from Platte County, Nebr. The westward limits of Loseke Creek materials in Nebraska have not been established.

Other Woodland variants, broadly characterized by a heavy preponderance of thick, coarsely tempered, cord-roughened pottery, have a yet more westerly distribution. Two of these—the Valley Focus and the Keith Focus—are represented by excavated village or camp and burial sites, and so have acquired some substance in addition to their sherd remains. Other variants are suggested by sherds and other artifact samples still too limited to permit definition and naming.

The Valley Focus is known principally from a small village site on Mira Creek, in Valley County, Nebr. (Hill and Kivett, 1941, pp. 146–193). The area of occupation here was well under an acre in extent, but the occurrence of debris throughout a zone some 16 to 40 inches thick suggested prolonged occupation rather than a camp site. Irregularly circular and subelliptical basins from 12 to 20 feet in diameter, with central hearths, are presumed to be the ruins of pole and skin, or mat, dwellings. Smaller refuse-filled pits were probably used for storage. Subsistence was by hunting and gathering; the bones of bison, deer, smaller mammals, and birds were fairly plentiful, but there was no evidence of domestic plants or of horticultural tools or devices. A single semiflexed burial in the upper detritus-laden fill of one of the house basins was without associated diagnostic cultural items. Potsherds were relatively plentiful throughout, worked bone and stone much less so.

The pottery, termed "Valley Cord-roughened," is a grit-tempered, cord-roughened ware. Vessels ranged in size from one-half pint to about 6 gallons. A truncated ovoid jar, wide-mouthed and with conoidal base, was apparently typical. Exterior surfaces were entirely cord-roughened, the impressions running vertically, diagonally, or crisscross. Decoration consisted of punchmarks or bosses on the exterior below the rim, cord-wrapped rod impressions, or a combination of the latter with punchmarks or bosses; and there was a little incising or trailing as well.

The scanty stonework consisted of stemmed and corner-notched projectile points of various sizes, but generally smaller than those of Kansas City Hopewellian; end scrapers; ovate to subrectangular knives, none beveled; and sandstone sharpening blocks, but no paired shaft abraders. Objects of bone included hollowed bison phalanges ("drill rests"); split deer metapodial and splinter awls; large and small bone tubes; bison scapula beamers; three serrate tips of deer or antelope metapodial fleshers; a bison ulna pick; and the biperforate section of a deer skull with horn bases, perhaps an ornament or headdress. A simple musselshell pendant was the only piece of worked shell found.

The areal extent of the Valley Focus complex has nowhere been outlined with certainty. In terms of ceramics, however, it undoubtedly represents a much more widely spread Central Plains Woodland tradition than does the Sterns Creek Focus (Hill and Kivett, 1941, p. 240). Throughout much of Nebraska, especially in the Sandhills, east to the Missouri, and southward, heavy-walled, coarsely tempered, cord-roughened sherds may be found, and with them often rims that have exterior punchmarks or bosses. Sherds with this rim treatment have been reported (Hill and Kivett, 1941, pp. 194–243) from such widely separated localities as Cass, Douglas, Dixon, Platte, Holt, and Cherry Counties. It is not yet certain, however, that other elements of the Valley Focus complex are similarly distributed or that these sherd occurrences always and invariably involve only Valley Cord-roughened. The type Ash Hollow Cord-Roughened, represented in Lens D at Ash Hollow Cave, Garden County (Champe, 1946, p. 56), and perhaps at the Kelso site, Hooker County, has a general resemblance to the Valley ware (Kivett, 1952, p. 67) and may be represented by some of the surface finds.

Thick cord-roughened grit-tempered sherds, including exterior rim bosses, occurred as a small minority ware at Renner, and are apparently present also at the Trowbridge site. From their persistent presence in small numbers in local collections from various lesser creek valleys in northeastern Kansas, I would suspect a wide scattering of camp or village sites here. Their distribution westwardly, and also south of Kansas River, has not been worked out. I have seen heavy siliceous-tempered, cord-roughened sherds from Montgomery County, near Independence, and from the vicinity of Larned in Pawnee County. Interpretation of this Kansas material as Valley Focus, as in the case of many of the Nebraska surface sherd finds, is premature in the absence of more adequate pottery samples and of other traits diagnostic of the named complex.

The Keith Focus has been set up on the basis of findings at several excavated village and burial sites, chiefly in the Republican River drainage of southern Nebraska and northern Kansas (Kivett, 1949, 1952, 1953). Indicated are small communities, each with traces of not more than 4 to 6 structures occupying usually much less than an acre of ground; circular to irregularly elliptical shallow basins, sometimes with poorly marked fireplaces in the center, and thought to represent the sites of small perishable habitations constructed of poles and thatch or skins; postmolds and small refuse-filled pits scattered randomly about the living area; presence of deer, small mammal, and bird bones, as well as bison; absence of maize or other domestic plant food remains, or of implements clearly designed for horticulture; and scarcity of pottery, stone, and bone artifacts as compared to those in later pottery-bearing sites of the region.

Among the distinguishing characteristics of the Keith Focus is the pottery designated Harlan Cord-roughened. This is a thick-walled, calcite-tempered ware, with allover cord roughening on vessel exteriors. The usual shape appears to have been a large wide-mouthed jar, with more or less conoidal base, direct unthickened rim, and flattened undecorated lip. Fine cord or fabric imprints are often visible on interior sherd surfaces, these running at right angles to the heavier exterior impressions. Punched bosses, cord-wrapped rod impressions, and other decorative treatment of the rims, such as occurs in Valley Focus pottery, is absent from Keith Focus material.

Work in stone includes a rather varied series of small to large stemmed and barbed projectile points, often serrate; end scrapers; small chipped celts; ovate knives, but no beveled types; irregular sandstone sharpening blocks, but no paired shaft smoothers; pecking and hammer stones; and cupped grinding stones. Bonework consists of split deer metapodial and splinter awls; scapula "knives" or scrapers, but no hoes; plain, incised, and barrel-shaped bird-bone beads. There is much more worked shell than in most other Plains sites, and this was associated for the most part with the mortuary complex. The shells of fresh-water mussels were fashioned into triangular and crescentic pendants, often corner- or end-perforated; disk beads from 6 to 18 mm. in diameter; short cylindrical beads with one flat side, with drilling from this surface and from one end so as to intersect at right angles; and occasionally other forms. Marine shells are represented by short thick subcylindrical segments of *Busycon* columella, drilled lengthwise; and by spire-lopped Olivellas.

The Keith Focus mortuary complex, largely through the excellent work of Kivett (1953), is better known than that of many other Plains cultures that have been more extensively investigated. Secondary interment of disarticulated skeletal parts was customary. Sometimes these remains are found in the village or camp area, but they are more often in terrace, bluff, or hilltop locations at a distance. In some cases, bundled or scattered bones of one or several individuals were placed in small pits 3 to 4 feet across and up to 6 feet deep, these pits tending to occur a few feet from one another in clusters (Strong, 1935, pp. 116–122; Wedel, 1935, pp. 174–179). Equally characteristic are larger basins up to 20 feet or more in diameter, within or under which there may be smaller pits. In these larger ossuaries, as exemplified at the Woodruff burial site in Phillips County, Kans. (Kivett, 1953), have been found the scattered remains of dozens or scores of individuals—so many, indeed, in comparison with the size of the known settlements that it can be presumed these were the final repositories for the dead from several villages and camps. Charcoal, burned earth, and scorched bone fragments indicate that fire played a role in the burial rites. Mortuary offerings include large numbers—often running into the thousands—of shell disk beads and bead blanks, many of the latter unperforated, as well as shell pendants, chipped stone, and occasionally other items.

The geographic extent of Keith Focus outside the Upper Republican valley center is not certainly known. For Nebraska, Kivett (1953, p. 132) reports pottery closely similar to Harlan Cord-roughened from Davis Creek in Sherman County, at Amherst Reservoir in Buffalo County, from the Sandhill region, and from Richardson County in the extreme southeastern corner of the State. To the south in Kansas, what appears to be the same or a similar calcite-tempered ware is found in the Woodland level (Occupation B) at the Pottorff site and again at the Walter site, both in Lane County; in both places it is associated with a few non-calcite-tempered sherds that otherwise are essentially similar. Calcite-tempered sherds were found as surface material in Scott County; and at Coal Oil Canyon in extreme western Logan County, southeast of Wallace.[46] Western Kansas, and perhaps parts of eastern Colorado, thus appear to lie within the range of Keith Focus materials.

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[46] Among sherd samples sent to George Metcalf, museum aide, by P. H. Bowman, Wallace, Kans.

The preceding discussion will afford some understanding of the diverse nature of the Central Plains materials currently classed as Woodland, and also of their basic resemblances. Two principal patterns seem to be indicated. The comparatively rich Hopewellian communities of the Kansas City district, based on a semihorticultural subsistence economy, possessing a varied ceramic and material culture inventory, and with strong implications of a fairly stable community life, are in marked contrast to the much simpler, less settled, basically hunters and gatherers suggested by the widespread Keith, Valley, and related remains. The interrelationships, cultural and chronological, between the several complexes are not yet clear, though they are emerging. Kivett (1953, p. 135) has indicated the direction in which present evidence points by tentatively grouping the Valley and Keith Foci into the Orleans Aspect, to which he suggests (Kivett, 1952, p. 67) the Kelso and Ash Hollow materials may eventually be added also.

The analysis of additional materials from a variety of sites will be needed before the task of classification can be satisfactorily done, and the time span of the Woodland occupation of the Central Plains estimated. At the moment, a fair case can be made for general chronological equivalence of most of the named or otherwise recognized complexes. Spaulding (1949) has directed attention to the Hopewellian elements found at the Younkin mound. These include dentate-stamped and rocker-marked pottery, a platform pipe, and the "general character of the burial" (e. g., disarticulated and sometimes fragmentary bones, some primary interment, evidence of burning, mound construction). A cord-roughened vessel fragment at Younkin (Schultz and Spaulding, 1948, pl. 29, a), on the other hand, looks less like Hopewellian than like some of the narrow-mouthed jars from Loseke and Eagle Creek sites (Hill and Kivett, 1941, pl. 28, fig. 1; Kivett, 1952, pl. 29, A). Other Younkin items, such as abundant plain and incised bird-bone beads, shell disk beads, and small finely serrate points—features once commonly found by collectors in mounds of the Manhattan locality—are reminiscent of Keith Focus mortuary materials. This indirect Hopewellian-Keith Focus correlation, via Younkin, is also hinted at by the finding of a typical Hopewellian rocker-marked sherd in the Woodland level (Occupation B) at the Pottorff site, along with calcite-tempered cord-roughened sherds and large stemmed or corner-notched projectile points. The presence of small numbers of cord-roughened Valley (?) type sherds in Kansas City Hopewellian sites is established. Spaulding (1949, p. 110) observes that the "probable occurrence in Lens D at Ash Hollow Cave" of sherds of the "Eagle Creek type" along with Valley Focus pottery (but see Kivett, 1952, p. 67) probably connotes contemporaneity; and as supporting evidence he cites the presence in Eagle Creek ware of "a noded and cord-roughened sherd with cord impressions above the nodes." Three-way temporal equivalence has also been suggested for Sterns Creek, Valley Focus, and Hopewellian on the basis of reported sherd associations at the Leahy site near Peru, Nebr. (Champe, 1946, p. 68); but the field observers here have recorded the possibility of redeposition of materials that may have originated in more than one village or camp site (Hill and Kivett, 1941, p. 199).

In the present state of our information, I do not believe that the cross finds and apparent correlations listed above can be accepted as proof of anything more than a very general contemporaneity. They suggest that several culture complexes, each covering a time span of undetermined length, probably were at times in contact with one another somewhere; but they do not indicate at what period or for how long in their respective time spans these contacts were operating. The depth of the archeological zones in the Kansas City Hopewellian sites suggests some length of occupation; and it has been pointed out by Kivett (1949, p. 282) that some of the western Woodland sites also have a fairly thick, if not very rich, cultural layer. The relative abundance and wide distribution of Woodland habitation sites on most secondary streams of the Central Plains also suggest the presence of these little communities throughout a period of considerable length.

As is to be expected, there are still divergent views regarding the probable sequence of the Woodland complexes in the region. Spaulding (1949, pp. 110–111) suggests that the typologically early Valley Focus is pre-Hopewellian, "with probable late survival in the area not strongly influenced by the Hopewellian settlements." Some of the other variants, he further points out, "may fill a chronological gap between Hopewellian and developed Upper Republican," although available stratigraphic and associational data "point to a Middle or Early Woodland date for all of the Central Plains Woodland variants." More recently, Kivett (1953, p. 137) has suggested priority in time for the Keith Focus, with the Valley Focus material possibly representing "a Hopewellian influence on a simple Woodland complex such as the Keith Focus."

Between Kansas City Hopewellian and the dominant prehistoric post-Woodland complexes of the Central Plains, such as Upper Republican, I see no specific similarities that can be regarded as evidence of contact or connection between the two horizons represented. Like the inferred semisedentary semihorticultural community living, such similarities as exist involve widespread elements of little use in demonstrating direct relationships. Essentially, I believe, the same holds as between Valley Focus and the post-Woodland village cultures. On the other hand, Kivett (1953, p. 136) has pointed out "some basic similarities" between some Upper Republican and Keith Focus Woodland burial practices. These include primary and secondary burials in a basinlike ossuary pit, and the occurrence as mortuary accompaniments of shell disk beads, conch shell ornaments, Olivella and gastropod beads, flake knives or scrapers, end scrapers, shaft wrenches of deer-leg bones, undecorated tubular bone beads, and hammerstones. I have the impression, too, that Keith Focus may include more small projectile points perhaps trending toward the small triangular side-notched Upper Republican form than does Valley Focus, where somewhat larger stemmed and corner-notched types remind one of Hopewellian forms. I am not altogether convinced by the foregoing items; but they suggest that Keith Focus may be closer to Upper Republican, Valley Focus to Hopewellian. Where Sterns Creek would fit into such a scheme, I am not prepared to say; but the Loseke Focus-Eagle Creek-Missouri Bluffs materials, I think, would most nearly qualify for filling the gap between Middle Woodland and post-Woodland horizons north of the Republican, or perhaps the Platte, River.

Many of the now puzzling things about the Central Plains Woodland materials, including focus interrelationships, will doubtless be clarified when radiocarbon dates or other acceptable devices provide a sound basis for chronology. At present, there is but one published Woodland radiocarbon date for the Kansas-Nebraska region—that of A. D. 611±240 years, for charred timbers from Woodruff ossuary (Wedel and Kivett, 1956, p. 414; but see also p. 619, this bulletin). This suggests a somewhat earlier period for Woodland here than has been previously estimated, and precedes by three to five centuries the estimates for the subsequent Upper Republican occupation of the region. If, despite the presumed time spread of several centuries between Woodruff, as dated, and Upper Republican, there is a direct line of relationship between Keith Focus and early Upper Republican, we may have some measure of the persistence with which the simple westerly Woodland cultures clung to their Spartan way of life.

For the most part, the Central Plains complexes discussed above are probably of the Middle Woodland period, as Spaulding (1949) has pointed out. Evidences of earlier Woodland or immediately pre-Woodland occupations of the Kansas region are meager, and the investigations of the National Museum were not directly concerned with any materials that can be certainly so regarded. That these are very likely present, however, is suggested by various circumstances. Probably the most substantial of these circumstances at the moment is the Younkin mound (Schultz and Spaulding, 1948) where long carved bone hairpins, a cut and polished human fibula, paired clamshell pendants, and perhaps other items are regarded as indication of Archaic affinities. Spaulding (1949, p. 111) has suggested that this may be evidence of an Archaic tradition that persisted in northeastern Kansas into the Middle Woodland period.

There have been sporadic finds of boatstones in eastern Kansas that may have a similar early affiliation. One in the national collections (fig. 104, *b*) is from Labette County, and I have seen other fine specimens in private collections from the vicinity of Independence, Montgomery County, and Elgin, Chautauqua County. Their site associations, other than that they were local finds, are unknown to me. Such objects have been reported also from preceramic (?) burials in McPherson and Scottsbluff Counties, Nebr. (Champe, 1949 b, p. 16; Kivett, 1952, p. 65), as well as from a site in Sherman County, Nebr. (Hill and Kivett, 1941, p. 219), where grit- and calcite-tempered cord-roughened sherds also occurred. They are evidently early in the Kansas region, but how early remains to be determined.

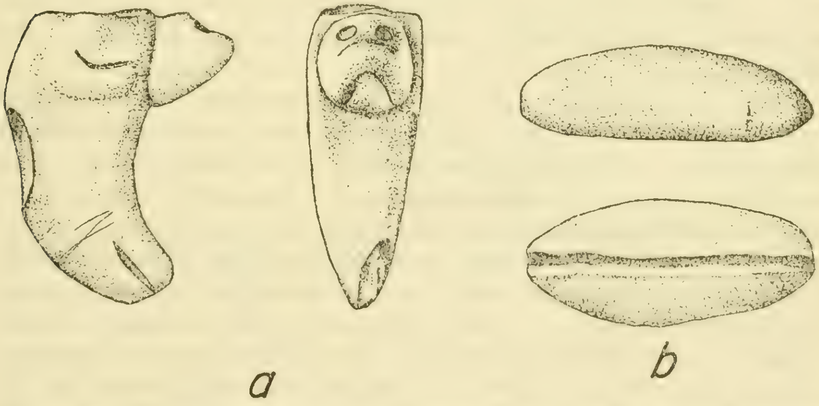

FIGURE 104.—Miscellaneous specimens from eastern Kansas. *a*, Effigy pipe of indurated clay, 2½ miles south of Muscotah, courtesy of F. Ward; *b*, boatstone from mound near Oswego (USNM 232588).

## LATE WOODLAND-MISSISSIPPI COMPLEXES

The Central Plains equivalent of the Late Woodland-Mississippi transition in the Eastern United States is represented by several prehistoric semisedentary pottery-making cultures in the Nebraska-Kansas region. Sites are numerous and widely distributed, with indications that they extend as far west as Colorado and Wyoming. Village sites are characterized especially by the remains of substantial earth lodges, along with quantities of refuse and artifacts in stone, bone, shell, pottery, and other materials. They evidently indicate a much more stable pattern of settlement than is inferrable from the earlier western Woodland sites. There is direct evidence that subsistence was based in part on a small-scale, hoe-linked, maize-bean-squash-sunflower horticulture and in part on hunting, fishing, and gathering. The general time period has been thought to include roughly the 13th to 15th centuries, but these dates are subject to revision. The best known of these manifestations at present include the Nebraska Aspect along the Missouri River bluffs zone and the Upper Republican Aspect in the loess plains to the west. A third is herein suggested for the Smoky Hill-Blue-Kansas River drainage in eastern Kansas.

The Upper Republican Aspect was first studied and is still best known in the valley of the Republican River in southern Nebraska (Strong, 1935; Wedel, 1934, 1935). Here it is represented by numerous small village sites strung along the tributaries of the Republican and, to a lesser extent, along the main stream. A second important area of occurrence is in the Loup River drainage in central Nebraska, where several variants are represented (see, e. g., Champe, 1936). Closely related materials are suggested in the Solomon, Saline, and Smoky Hill drainages of northern Kansas; and the upper component at the Pottorff site in Lane County, described herein, is clearly Upper Republican. The southward extension of the complex has not yet been worked out.

Unfortunately, most of the investigations reported to date represent mainly limited digging at widely scattered sites—essentially an intensive survey—and so they do not provide a complete picture. Much more comprehensive in scope were the still unreported operations of the Nebraska State Historical Society and Works Progress Administration in 1939 at Site 25HW6 on Davis Creek, in Howard County, Nebr., where 21 house sites were opened; and the 1948 investigations of the River Basin Surveys (Kivett, 1949) and of the Nebraska Historical Society (Wedel, 1953 b, pp. 12–18, 41–42) at Medicine Creek reservoir area. Full publication of these major projects will increase greatly our understanding of the Upper Republican Aspect and some of its principal variants.

Upper Republican villages were characteristically small, unfortified, and often so unformalized that their exact size and limits are difficult to define. There appears to have been a marked preference for residence on small streams, perhaps because suitable building timber may have been more abundant here than on the main rivers, as seems to have been the case in the 19th century (Bryan, 1857, p. 475). On Medicine Creek, the settlements consisted of single-house units scattered over the terraces and higher hills at intervals of a few yards to several hundred feet, or of clusters of two to four units similarly separated from other small groups or single units. A similar loose clustering of habitations is indicated for the Davis Creek area. One or more small subfloor cache pits, seldom exceeding 4 to 4½ feet in depth, commonly occur in the lodge sites or just outside near the door. About the entrances may be found small midden areas; sometimes a single such refuse area evidently served several nearby houses.

The house sites, averaging 20 to 32 feet across, are generally square to rectangular in floor plan, rarely circular; they have rounded corners, four main roof supports arranged in a rectangle around an unlined central fireplace, and an entryway from 8 to 12 feet long opening toward the east, south, or west, or in an intermediate direction. Near the outer edge of the floor area are small postholes spaced at intervals of 1 to 3 feet, marking the secondary roof-wall supports. Floors show no burning or other attempt at hardening, as in some houses of the historic Village Indians. Sometimes the house floors were excavated from 6 to 20 inches so that a shallow pit house resulted. In many instances, however, the structure was evidently erected essentially on the contemporary ground surface from which little more than the sod had first been stripped; and the pitlike appearance of the excavated ruins is attributable to the deposition of a variable thickness of wind-blown soil subsequent to abandonment of the site (Wedel, 1934, 1941 a; Kivett, 1950). Such terms as "pit house" and "semisubterranean" thus are often incorrect when applied to Upper Republican houses, and cannot be used without some qualification.

Artifacts are usually much more plentiful than in the earlier Woodland sites. The pottery is sand or gravel tempered, fairly hard, and predominantly gray in color. Vessel exteriors are nearly always roughened with a cord-wrapped paddle; the impressions are often clear and well marked, usually vertically oriented, and may be partly smoothed over. Full-bodied jars are the common form; they have a rounded base, flattish upperbody, and constricted neck. Rims are characteristically collared or wedge shaped, or else present a simple unthickened vertical or outcurving profile. Collared rims usually bear incised decoration, which may consist of 3 to 8 horizontal parallel lines, of groups of diagonals slanted in opposing directions or alternating with blank areas, of crosshatching, of paired lines running zigzag around the vessel, or of other motifs. The lower edge of the collar is not uncommonly notched or shaped into nodes or scallops. Handles, lugs, or other appendages are very rare or absent. Vessel forms other than jars seem to have been uncommon, but some bowls and miniatures are indicated.

Nonceramic materials include a variety of stone and bone artifacts. In chipped stone, there are small triangular notched and unnotched projectile points; numerous end and side scrapers; thin ovoid or ellipsoidal blades; diamond-shaped beveled knives; straight-shafted and T-shaped drills; chipped celts; and some heavy chert or quartzite chopping tools. Ground stone includes longitudinally grooved sandstone shaft smoothers; irregularly shaped sandstone sharpening blocks; grinding slabs with elliptical milling surface; manos; stone pipe bowls, either equal arm or with slightly projecting prow, and sometimes with incised zoomorphic decoration; a few carved human effigy heads; pecking and hammerstones; small pendants; and rare polished celts. Work in bone consisted of numerous bison scapula hoes; split mammal leg bone and splinter awls; eyed needles; fishhooks; edge-slotted knife handles; shaft wrenches of bone or antler; split metapodial gouges or fleshers, unserrated; pierced bison phalanges; ulna punches; dressed cylindrical antler sections; bison spine beamers; deer mandibles with polished diastema; oblong bone "counters"; plain tubular beads; incised bracelets or "bowguards" of thinly scraped antler or bone; and possibly deer metapodial beamers. The scanty shellwork is virtually limited to a few disk beads, tapered pendants, and musselshells with serrate edges.

The burial complex is not fully known, but apparently includes both ossuaries (secondary burial) and individual primary interments. The former (Strong, 1935, pp. 103–114) are large basins in which disarticulated bones and occasional articulated burials were deposited along with pottery, bone and shell ornaments, and other items. These burials include far fewer finished disk beads than occur in the "shell bead" ossuaries attributed to the earlier Woodland peoples (Kivett, 1953, p. 134).

The Nebraska Aspect is represented by numerous sites along the Missouri River in eastern Nebraska, western Iowa, and northeastern Kansas (Strong, 1935, pp. 250–267; Bell and Gilmore, 1936; Hill and Cooper, 1938; Cooper, 1940). It has not yet been reported from northwestern Missouri, although I have seen sherds apparently of Nebraska Aspect type in the Kansas City locality. Its presence in Doniphan County, Kans., has long been known, and the pottery and other materials recovered in 1937 by the National Museum party in two house sites near Doniphan falls readily into the pattern as established in Nebraska. There are variations in the complex from locality to locality, but these have not yet been worked out in the necessary detail.

Nebraska Aspect sites occur commonly on the narrow ridges and bluffs along the Missouri, overlooking the flood plain; and to lesser extent on the bluffs of the Elkhorn and lower Platte. They are found usually as straggling lines of house pits, rarely in groups, and apparently nowhere as compact settlements. Isolated house units also occur. The lodge sites are marked by pits ranging in size around 45 feet in diameter; Sterns reports one of 60 feet; and we were shown one in Doniphan County that measured well over 75 feet. The houses themselves are square or rectangular, with rounded corners, four main roof supports about a central fireplace, and have a long entryway. They were excavated to depths of 2½ to 4½ feet from the contemporary ground surface; and, unlike the Upper Republican structures, they seem everywhere to represent purposeful semisubterranean constructions, i. e., true pit houses. Cache pits occur within the houses, often in some numbers.

The burial complex is virtually unknown. On the basis of incomplete information, Strong suggests that scattered bones and partially articulated skeletons in natural hillocks or mounds associated with Nebraska Aspect potsherds may belong to the culture. If more specific data have since been gathered, I am unaware of their showings.

Pottery is tempered with sand or crushed granite, rarely with shell; and the proportion of aplastic varies widely from sparse to abundant. In color, there is a higher incidence of buffs and reddish browns than in Upper Republican. The basic shape is a globular jar with constricted neck and recurved rim. Simple unthickened rims predominate, but there is a small proportion of thickened collared rims with incised decoration like that on Upper Republican collared rims. Strap and loop handles occur much more frequently than in Upper Republican. Vessel exteriors were either left smooth or else were cord roughened; and the latter were frequently wiped over so that the cord impressions have been partially or largely obliterated. The cord impressions, when present, are rarely as clear-cut as in much of the Upper Republican ware. Incised body decoration usually occurs on shell-tempered pieces, often with polished surfaces, that are evidently due to alien influences originating in Middle Mississippi (Strong, 1935, p. 255; Wedel, 1943, p. 213). Also of pottery are a number of effigy heads somewhat reminiscent of those on Middle Mississippi pottery bowls, and many bent tubular pipes which commonly have incised or modeled decoration.

Nonpottery remains are fairly plentiful and varied. Chipped stone includes numbers of fairly heavy triangular projectile points, as well as small notched and unnotched forms; end and side scrapers; flake knives; ovoid and diamond-shaped knives, some of the latter beveled; celts; and T-shaped drills. Ground stone consists of longitudinally grooved shaft smoothers; variously shaped sharpening stones; polished celts; discoidal hammerstones; anvil stones; possibly stone trowels or modeling implements for pottery making; and occasional stone pipes that are sometimes carved in part to suggest animal and other forms. Bonework includes bison scapula hoes; socketed and unsocketed cylindrical antler sections; splinter and mammal bone awls; shaft wrenches of bone or antler; ulna picks;

eyed needles, rare; conical antler knapping tools; gouges or fleshers, untoothed; grooved deer jaws; fishhooks, including very large forms notched at the bend; toggle-head "harpoons"; bone beads, pendants, and bracelets or bow guards; deer jaws broken and polished at the diastema; knives or scrapers made of scapula fragments; and occasional digging tools made of bison frontal with attached horn core. Work in shell is rather more common than in Upper Republican; it consists of tanged spoons, perforated musselshell hoes, pendants with incisions suggesting birds or fishes, triangular gorgets, tapered pendants, disk and short tubular beads, and simple pendants fashioned by a deep cut across the umbo.

From almost the very beginning of organized archeological research in the Central Plains in the 1930's, it has been apparent that no sharp line separates Upper Republican and Nebraska Aspect distributions. As several workers have noted (e. g., Cooper, 1940, pl. 12; Gunnerson, 1952), there is a small proportion of incised collared rims of Upper Republican type in Nebraska Aspect sites along the Missouri; and conversely, Upper Republican materials from central Nebraska sometimes include rim effigies, vessel handles, and other features that are much more characteristic of eastern Nebraska wares. Northward, there are sites that can be fairly regarded as a late prehistoric merging of the two (Cooper, 1936). Much of the area in Nebraska and northern Kansas that lies between "classic" Upper Republican and Nebraska Aspect localities is occupied by culturally intermediate sites whose bias roughly reflects their remoteness from one, and proximity to the other, of the two named complexes (Strong, 1935, p. 168; Hill and Cooper, 1937). This unhappy circumstance, though not unexpectable, complicates the problem of pigeon-holing the many local variants in taxonomic terms.

The transitional character of many of these remains is, I suppose, one reason for a recent move to jettison the two existing aspect names and to replace them with a single designation—Aksarben (see Stephenson, 1954, p. 19). The basis for this proposed revision has nowhere been presented, so far as I am aware; and since I am not persuaded that there are any real gains in making such a change, I continue to regard the Upper Republican and Nebraska Aspects as valid categories and their designations as above reproach.

The very limited information available for northern Kansas suggests that, as in southern Nebraska, Upper Republican materials are westerly, Nebraska Aspect easterly. The former appear to be mainly west of the Smoky Hills and north of the Arkansas River; the Nebraska Aspect is essentially restricted to the Missouri Valley in northeastern Kansas. Between these two areas, and fanning out to the south, there is evidence of another widespread small-village complex that shares its basic traits with the two named aspects and also shows some noteworthy divergences. Pending more extended and intensive investigations, I can do little more than suggest at this time the nature of this complex. I believe it is represented by the Whiteford and Griffing sites described elsewhere in this paper, and perhaps also by the Minneapolis site (Wedel, 1935, pp. 210–237) on the lower Solomon. It seems probable that when the village sites noted many years ago by Brower and others in the lower Smoky Hill-Kansas River drainage have been properly investigated, they will be found to show consistent similarities and strong relationships to those here summarized. The "Upper Republican variants" on the Blue River, with cord-roughened sherds and bits of burnt house daub, perhaps also belong in this grouping. Provisionally, I suggest that the Griffing and nearby related earth-lodge village sites be classed as the Manhattan Focus, the Whiteford and Minneapolis sites as the Saline Focus; and that both be assigned to the Smoky Hill Aspect.

Village sites of the Smoky Hill Aspect are generally small, varying from one or two house units on a small creek terrace to a dozen or more widely scattered units strung along a creek or one of the larger streams. There is no indication of defensive works. House sites are square to rectangular, with rounded corners, four main roof supports set around a central fire basin, and an extended entryway. Caches occur inside the houses and perhaps also outside. In the Minneapolis, Griffing, and Whiteford sites, the only ones in which house ruins have as yet been excavated, the lodges were visible prior to excavation as slight elevations; and it is evident that the structures were originally built on the sod-stripped ground surface, not let down into it as were the Nebraska Aspect dwellings.

Pottery and other materials are moderately plentiful. The pottery is usually tempered with sand or gravel, but crushed sherds and bone are sometimes present. A few bowls are indicated, but large jars were the prevalent form; their height tends to exceed the diameter, but some with flattish upperbodies in the Upper Republican style are also present. Rims are mostly simple, unthickened, and vertical or outcurved; occasional examples show some thickening and a crude attempt at a collared effect. Very rarely, the collared rims bear incising; the lower edge may be scalloped or noded; but more commonly, the allover cord roughening is carried from the body over the rim to the lip. On the lower Blue and Kansas Rivers, many of the sherds have a characteristic orange-brown color and show a strong tendency for the surfaces to peel or flake away. Small strap handles, usually arising from the vessel lip and connecting this with the neck, are present. Essentially, the pottery remains are what I have designated Riley Cord-roughened on the basis of our admittedly small sample from the Griffing site.

Less is known of the nonceramic materials, but they seem to parallel generally those of the Upper Republican and Nebraska aspects. Among chipped artifacts, projectile points are roughly flaked and include triangular notched and unnotched forms; end scrapers are present; and knives include thin lanceolate and diamond-shaped forms, the latter commonly beveled, as well as occasional long thin well-chipped curved forms with rounded ends. Corner-tang knives are not uncommon in the general area, but their association with the culture under consideration has not been established. Ground stone includes longitudinally grooved shaft smoothers; polished and chipped celts, as well as some which are partly polished and partly chipped; pipes with projecting stem or prow; mullers; and many large flat or slightly hollowed grinding slabs. Work in bone consists of bison scapula hoes; awls of split mammal leg bone; deer metapodial beamers; ulna picks or punches; plain tubes and tubular beads; and shaft straighteners. I suspect that some of the material classed by Brower as "Harahey," including curved bone fishhooks and shell beads, may also represent this complex; but the lack of specific provenience for his specimens, the impossibility of rechecking many of his sites, and the uncontrolled character of his work discourage unqualified inclusion of his data here.

The Smoky Hill burial complex is uncertain; but if the Whiteford site is correctly included here, primary flexed interments accompanied by occasional pottery, stone, and shell objects may be added to the tentative trait inventory. The massed burials at this site suggest that it served a number of nearby communities, and so may or may not be entirely representative of other manifestations of the Smoky Hill complex. That the "Harahey" mounds of Brower belong to this complex remains to be demonstrated, but I doubt that they do.

The exact relationships of the Smoky Hill materials to those of the Upper Republican and Nebraska Aspects remain, of course, to be demonstrated when larger bodies of controlled data are in hand. That strong relationships exist is clear; and I would expect that the Smoky Hill sites nearest the Upper Republican and Nebraska Aspect localities will exhibit stronger similarities than those more remotely situated. That the Smoky Hill sites can be satisfactorily assigned to either of these aspects I nevertheless doubt. To me, the ceramic remains of the Smoky Hill complex sites, and the meager but provocative hints we have of them yet farther south, suggest a more generalized tradition than either Upper Republican or Nebraska Aspect wares. It is tempting to see in this the "sort of highest common ceramic factor" out of which developed the "classic" Upper Republican pottery to the west and northwest and the Nebraska Aspect pottery to the east—the former perhaps by stimulus from Late Woodland cultures in the upper Mississippi-Great Lakes area, the latter through contacts with Middle Mississippi influences coming up the Missouri. From here, it is only a short, if at the moment hazardous, step to propose that the Smoky Hill cultural complex generally is not far from the sort of generalized "ancestral culture" which Spaulding (1956, p. 79) aptly suggests may have arisen in the Central Plains in post-Hopewellian times and fathered, so to speak, the Upper Republican and Nebraska Aspects as we now know them.

The geographical range of the Smoky Hill Aspect also awaits further study. Cord-roughened sherds with the characteristic orange-brown color, friable surface, and simple or slightly thickened cord-roughened rims occur widely in eastern Kansas. This sort of pottery is scattered along the Smoky Hill-Kansas River valley from Salina eastward, and occurs on many of the lesser tributaries as well. I have seen it, or closely similar material, from the vicinity of Ottawa, from sites in the upper Cottonwood drainage, in Sedgwick County, from south-central Kansas, around Humboldt in Allen County, and in various localities in southeastern Kansas. According to my field notes, it occurs in many of these localities in direct association with lumps of burned grass-impressed clay that almost certainly are from earth-lodge remains. A sustained attack on these obscure, but seemingly abundant, remains is needed to permit clearer definition of their distribution south from the Smoky Hill-Kansas River locality and to clarify their nature and variations.

The suggested southward distribution, as down the Neosho drainage into Oklahoma, should certainly be worked out. As has been noted elsewhere in this paper, locally exotic pottery commonly associated with the Spiro Focus was found in direct association with Smoky Hill burials at the Whiteford site. This, aside from its obvious connotations of chronological equivalence, suggests the possibility of more fundamental relationships that should not be entirely overlooked because of the wide and obvious differences otherwise between the two manifestations. The house types attributed by Orr to the Early and Middle Spiro components, for example, are not far, in respect to floor plan, from the typical Central Plains earth-lodge, which appears first in the general time period and cultural stage with which we are here concerned; and the Spiro houses are said (Orr, 1946, p. 230) to have been "a few inches to a foot under the surface." As I have pointed out above, many of the Central Plains earth lodges were not pit houses but were surface or near-surface structures, apparently like those of the lower Arkansas-Red River area. In the Central Plains, moreover, the square or rectangular earth lodge is associated with hoe tillage, direct evidence of fishing, a basically eastern pottery complex, and a way of life generally much more eastern than western in flavor. Whatever our final views regarding its source, the case against a Southeastern derivation draws no support from the assertion that the Plains earth lodge cannot have come "from the Southeast where the pit house does not occur" (Jennings, Reed, et al., 1956, p. 87).

Returning to the main thread of our discussion it is immediately apparent that the three cultural complexes just summarized—the Upper Republican Aspect, the Nebraska Aspect, and the Smoky Hill Aspect—share a good many traits and trait complexes. These include particularly the following:

(1) A subsistence economy divided about equally between maize horticulture and hunting.

(2) Semipermanent villages, small, unfortified, and arranged in no apparent order.

(3) Villages located sometimes along the larger streams, and as often on the lesser creeks, adjacent to water, wood, and arable land.

(4) Houses built on the ground surface or semisubterranean.

(5) Square to rectangular earth lodges, with rounded corners, four primary roof supports arranged around a central fireplace, and extended entryway.

(6) Bell-shaped and cylindrical cache pits, in and between the houses.

(7) Burial by primary single interment, and also in communal ossuaries.

(8) Grit-tempered pottery, surfaces cord roughened or smoothed; simple vertical to flared or collared rims, latter with incised or cord-impressed decoration.

(9) Chipped projectile points, small, unnotched, side-notched, or side- and base-notched.

(10) Diamond-shaped and ellipsoidal knives.

(11) Chipped end scrapers.

(12) Pipes of pottery (bent tubular) and of stone (equal arm or with slightly projecting stem).

(13) Scapula hoes.

(14) Longitudinally grooved sandstone shaft smoothers.

(15) Bone awls of split deer cannon bone.

(16) Arrowshaft wrenches of bone and antler.

(17) Bone fishhooks.

(18) Smooth-bladed fleshing tools of mammal leg bone.

(19) Grinding implements of stone.

(20) Scanty and simple work in shell.

As is well known, some of these characteristics have a wide distribution, spatially and temporally, throughout the Great Plains. They include, with some modification, the traits listed by Lehmer (1954 a, p. 139) as diagnostic of the Plains Village pattern. To these have been added others that he regards as distinguishing one of three broad cultural traditions within this pattern—his Central Plains tradition (Lehmer, 1954 a, p. 143), or the Central Plains phase of Hurt (1953, p.

54).[47] I have omitted one item—figurines—included by Lehmer and Hurt as a Central Plains diagnostic; and have added two or three that, while not peculiar to this phase or tradition, are more or less regularly recurring and have, within the Central Plains geographical area, a limited and significant distribution in time or in space. In other words, I have sought to characterize broadly the Central Plains phase rather than to emphasize its distinctiveness with respect to other proposed categories, contemporary or otherwise.

The relationships of the Upper Republican and Nebraska Aspects to more or less contemporary prehistoric cultures to the north along the Missouri River have been discussed by others (see, for example, Lehmer, 1954 a, 1954 b; Spaulding, 1956) and need not detain us here. Southward, however, the relationships of the Central Plains phase are less well known, though it is clear that there are connections with several late prehistoric manifestations in Oklahoma and the Texas Panhandle. These connections perhaps merit more extended consideration than can be given them here, but in any case will probably not be clearly understandable until systematic investigations have been undertaken at various localities in southern Kansas and northern Oklahoma. Such investigations should be pointed toward clarifying the relationships of the late prehistoric Kansas-Nebraska materials to such southerly Plains Village complexes as the Panhandle Aspect of the upper Canadian, the Custer Focus of west-central Oklahoma, and the Washita River Focus farther to the east.

The Panhandle Aspect (Krieger, 1946, p. 74), including the Antelope Creek (Krieger, 1946, pp. 41–71) and Optima (Watson, 1950) Foci, shares a great many traits with western manifestations of the Central Plains phase; and its resemblances to Upper Republican in particular have been repeatedly pointed out. There are noteworthy differences, of course, that have not escaped notice. The Panhandle houses diverge in many particulars from the Central Plains earth lodge, though sharing the four-post roof supports, vestibule entryway, and other features. The artifact inventories are generally very similar; but such Panhandle items as bone digging stick heads and transversely scored bones are conspicuously absent from Upper Republican and, conversely, fishhooks and arrowshaft wrenches consistently occur in the latter but are absent from Panhandle sites. The Panhandle pottery complex lacks the specialized collared and incised rims of Upper Republican, thus apparently conforming to the more widely spread and generalized ceramic tradition represented by the Smoky Hill sites of Kansas. I have the impression that the chipped flint industry of the Panhandle is rather more varied and extensive than that of Upper Republican; and this, along with the specialized digging stick heads and scored ribs, suggests a slightly later time level than that of Upper Republican. Krieger's (1947, p. 143) estimate of circa A. D. 1300–1450 is probably substantially correct (see also Suhm, Krieger, and Jelks, 1954, p. 392).

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[47] For an earlier, somewhat different, and now untenable use of the term Central Plains phase, correctly including however the Upper Republican Aspect, see Wedel, 1935, p. 251, and Strong, 1935, p. 2.

The Custer and Washita River Foci likewise present artifact assemblages reminiscent of Central Plains materials. They diverge most widely perhaps in their pottery, which includes various aplastics, smooth and cord-roughened surfaces, and deep jars with some flat disk bases. In both foci, however, there are square earth lodges with four center posts and a central fireplace, as well as numbers of cache pits. Bone digging stick heads and "notched or grooved bones suggesting the musical rasp" are reported for both, the bone arrowshaft wrench only from Washita River. Socketed scapula hoes have no parallel in the Central Plains phase, but do occur in southern sites of the later Great Bend Aspect in Kansas. The house complex seems to be close to Central Plains; but otherwise the artifact inventory again suggests a somewhat later time level, probably approaching the Lower Walnut Focus of southern Kansas.

Typological considerations, buttressed by stratigraphic and other evidence, have long ago established the fact that the Upper Republican and Nebraska Aspects followed in time such specifically Woodland manifestations as Kansas City Hopewellian and the several foci—Keith, Valley, etc.—of the Orleans Aspect to the west. The general time level during which these cultures flourished can be approximated; but unfortunately it cannot yet be said that our knowledge includes a well-controlled chronological sequence.

Elsewhere, I have estimated (Wedel, 1947 a, p. 150 and fig. 51) that Upper Republican, as it is known from the western part of its range, probably falls between circa A. D. 1200 and 1500, with later variants such as St. Helena in the east. The Nebraska Aspect was placed at circa 1300, with a questionable terminal date of about 1500 and a suggested break that I now question between it and the later Oneota. Substantially the same dating (A. D. 1300–1500) was suggested about the same time by Champe (1946, fig. 17), whose estimate derived some support from dendrochronological determinations on charcoal from Ash Hollow Cave. More recently, a radiocarbon date of A. D. 1176 ±150 years has been obtained (Crane, 1956, Sample M–113) from charcoal reported to come from the Woods site, "an Upper Republican site [in Clay County, Kans.] in the middle period of the development of this culture." The cultural associations here have not been published, and the nature of the "middle period" Upper Republican materials has apparently nowhere been set forth.

Two additional radiocarbon age determinations by Crane of the University of Michigan Memorial Phoenix Project Radiocarbon Laboratory and included here by courtesy of R. L. Stephenson, chairman of the Missouri Basin Chronology Program, pertain to the Upper Republican Aspect. Charcoal (M–835) from a house post at the Coufal site (25HW6) on Davis Creek, in Howard County, Nebr., is dated at A. D. 1138±200 years, which "should date the transition between Upper Republican and Nebraska Culture." Another charcoal sample (M–844) from a house post at site 25FT70, on Medicine Creek, Frontier County, Nebr., yielded a date of A. D. 1458±200 years. Both dates fall within the expectable time span; but if additional determinations confirm the greater age of the Coufal site over site 25FT70, and by more than three centuries, some reorientation of current thinking on Central Plains prehistory will be in order.

Certain other Kansas data throw some light on this matter of chronology, if obliquely. It will be recalled that the Whiteford burial pit, here included in the Smoky Hill Aspect, yielded an effigy clay pipe fragment and a large sherd of Crockett Curvilinear Incised pottery. The latter resembles pottery assigned by Orr (1946, fig. 32, *e*) to the Middle Spiro component, which also includes square houses with four center posts. The Spiro situation, unfortunately, is a highly complicated one and its interpretation has given rise to wide diversity of opinion. The problem of cross dating is not simplified by recently published radiocarbon dates from Spiro (Crane, 1956, Samples M–14 and M–54). Five of these average out to circa 330 B. C. ±200 years, and the sixth is A. D. 1316 ±250 years. Only the last of these is within a period I would consider likely for contact between the Smoky Hill Aspect and the lower Arkansas area, as indicated at the Whiteford site.

Farther west, the Upper Republican manifestation at Pottorff, like the better known and more extensively worked sites in Nebraska, has yielded no Southwestern potsherds that might be useful for cross dating. This is the southernmost site now known to me in which such typical Upper Republican materials as collared pottery, bone fishhooks, and four-post earth lodges have been found. These items may turn up, of course, in the Arkansas River drainage yet farther south if diligent search is made. It may be significant, however, that the only comparable materials yet reported from southwestern Kansas, as at the Pratt site, are divergent. They include preponderance of cord-roughened pottery, along with other items—for example, bone digging stick heads, transversely scored ribs, and "rib-edge" awls—that suggest the Panhandle-Custer-Washita River materials more strongly than they do Upper Republican. Moreover, this complex, without the preponderance of cord-roughened pottery, is curiously like the Lower Walnut Focus to which it may be in part ancestral. With it is associated Southwestern pottery of the 1425–1550 period—earlier, in general, than the puebloan trade pieces in Great Bend Aspect sites, and confirming the pre-White time level. If there is true Upper Republican material in this section of the State, it presumably antedates the Pratt complex.

With the general lengthening of our time estimates in light of dendrochronology and radiocarbon dating, it now seems very probable to me that the Upper Republican Aspect, or perhaps a more generalized antecedent not far from the Smoky Hill Aspect in nature, may have been in existence as early as the 11th century of our era. Almost certainly, the more conservative estimates with which this discussion began are too late to accommodate the beginning stages of the Central Plains phase.

The western part of the Upper Republican territory was apparently largely abandoned by earth-lodge-dwelling people prior to 1500, perhaps because of horticultural difficulties brought on by widespread drought (Wedel, 1940 a, p. 329; 1941 a; 1953 a) or possibly for other reasons. I find unacceptable Lehmer's view (Lehmer, 1954 a, p. 149) that this abandonment was caused by the drought of 1539–64, and the further inference (Lehmer, 1954 b, p. 147) that the settlements of Harahey reported to Coronado "may well have been Upper Republican." I know of no evidence, and Lehmer offers none, of Upper Republican villages occupied thus into White contact times. On the contrary, the Nebraska villages contemporary with the Quiviran settlements identified in Kansas with Coronado's visit are specifically Lower Loup in type, not Upper Republican.

The late date adopted by Lehmer seems open to argument on another score also. Strong (1940, p. 382), and I following him (Wedel, 1941 a, p. 26, n. 12), suggested long ago that since the transitional stages between Upper Republican and Lower Loup-Pawnee were apparently missing in the Platte-Loup drainage, perhaps the connecting threads were to be sought outside the Nebraska area. Lehmer has elaborated this thought lucidly in his Central Plains-Middle Missouri-Coalescent sequence; but in bringing the Central Plains people out of Nebraska after the 1539–64 drought, he has allowed much too short a period for their conversion to a Coalescent tradition and subsequent return to the Platte-Loup locality by Lower Loup times.

In my opinion, a 15th-century retraction of Upper Republican territory in Nebraska and northern Kansas seems much more likely. For the putative early 16th-century Upper Republican manifestation at Ash Hollow Cave, Champe (1946, p. 48) has offered an explanation that seems to me more realistic than the application of that dating to a general occupation of the region. If any single drought triggered the sort of exodus that has been suggested, I believe that of 1439–54 is a more likely prospect—or else the cumulative effects of this and the shorter following one of 1459–68 (Wedel, 1941 a, p. 25). In any case, what probably followed the indicated movement out of the western plains, and the ultimate outcome of the Upper Republican and Nebraska Aspect complexes when their carriers shifted toward the east and north, may be surmised from Spaulding's recent monograph on the Arzberger site (Spaulding, 1956).

## THE GREAT BEND ASPECT

The Great Bend Aspect, as defined in this paper, is based very largely on two groups of partially excavated sites in central and southern Kansas. Most of our current information comes from several village sites (Tobias, Thompson, Major, Hayes) on the headwaters of Little Arkansas River and from another (Malone) on Cow Creek, these locations all lying in Rice County. There are at least two large and important sites (Paint Creek, Swenson) in the valley of Smoky Hill River some 20 miles to the east, these actually being more precisely described as on Paint and Sharps creeks respectively, in McPherson County. I have unconfirmed reports of one or two additional sites in the Smoky Hill valley in the general vicinity of Lindsborg. In this paper I have classed the Rice County sites as the Little River Focus, to which those in McPherson County should probably also be allocated.

A second and slightly deviant cluster of sites on Walnut River, near its union with the Arkansas at Arkansas City, constitutes the Lower Walnut Focus. Limited surface collections I have seen suggest related sites on Grouse Creek to the east; farther up the Walnut near Augusta; and probably elsewhere in this section of the Arkansas River basin. The analytical work needed to allocate these scattered sites to one of the existing foci, or perhaps to another as yet undefined, remains to be done.

Pottery and other materials from localities outside those specified suggest a somewhat wider distribution for the complex. It is certainly indicated on the headwaters of Cottonwood River near Marion, where there are, or formerly were, village sites of some size and richness of content (p. 497). Westward, there is at least one site on Pawnee Creek near Larned, and apparently another, or several, on Walnut Creek near Great Bend. Smith (1949 a, p. 293) has reported a camp site of the culture on the Smoky Hill in Ellsworth County. The Cow Creek and Little Arkansas River drainages in Rice County are littered with sites, in addition to the ones that have had some systematic investigation. Small sites without visible refuse mounds, but with typical pottery and flint work, occur on Sand Creek and other small streams near Newton, in Harvey County; and I strongly suspect that this situation will be found to hold for many other lesser waterways of the Great Bend lowland, especially where the soils are not too sandy or the terrain subject to recurrent flooding.

So far as my present information goes, there appear to be no reported village sites of the Great Bend Aspect north of the Smoky Hill River, west of Larned on the Arkansas River, east of Marion, Butler, and Cowley Counties, or south of the Arkansas. Much of the country within the great bend impresses me as poorly suited to occupancy by semihorticultural Village Indians, though they undoubtedly hunted there; but it would seem strange indeed if the lower reaches of such streams as the Ninnescah, the Chikaskia, Slate Creek, and Bluff Creek, were entirely overlooked by the Great Bend peoples.

The known geographical distribution of the Great Bend Aspect in Kansas (fig. 105), as outlined above, may also be expressed in terms of physiographic subdivisions. The sites composing the complex lie between the Flint Hills upland on the east and the High Plains on the west, extending but a short distance northward into the Dissected High Plains of north-central Kansas. They are essentially restricted to the Great Bend and McPherson Lowlands as these are delimited by Schoewe (1949, fig. 22). Their eventual discovery also in the Wellington Lowland can probably be predicted. Southward extension of the complex into Oklahoma, where it might be expected to occur, has not been established.

The northern sites that I have designated the Little River Focus are found on streamside terraces or, where they occur near the headwaters of a stream, on sloping hillsides and prairie ridges. None of the sites I know is directly on the larger streams, such as the Smoky Hill and the Arkansas. In most cases, however, they are in proximity to fairly sure water supplies. The Tobias and Thompson sites, for example, are situated about as far up the Little Arkansas as live water is to be found. They are separated by a streamlet one can almost step over in the summer months; but from the rocky ledges bordering it at this point there issued, even in the summer of 1954 after a succession of very dry years, a steady seep of cool potable water. Below this spot for many miles the Little Arkansas consisted mainly of discontinuous stagnant pools unfit for domestic consumption. The southerly sites of the Lower Walnut Focus are situated on terraces and on bluffs immediately overlooking the Walnut River. In the Marion vicinity, the sites appear to have been either on flood-free terraces overlooking the Cottonwood River bottoms or else on bluffs with the river immediately at their base.

The principal known sites of the Great Bend Aspect, where cultivation has not blurred or effaced the surface traces, consist of low

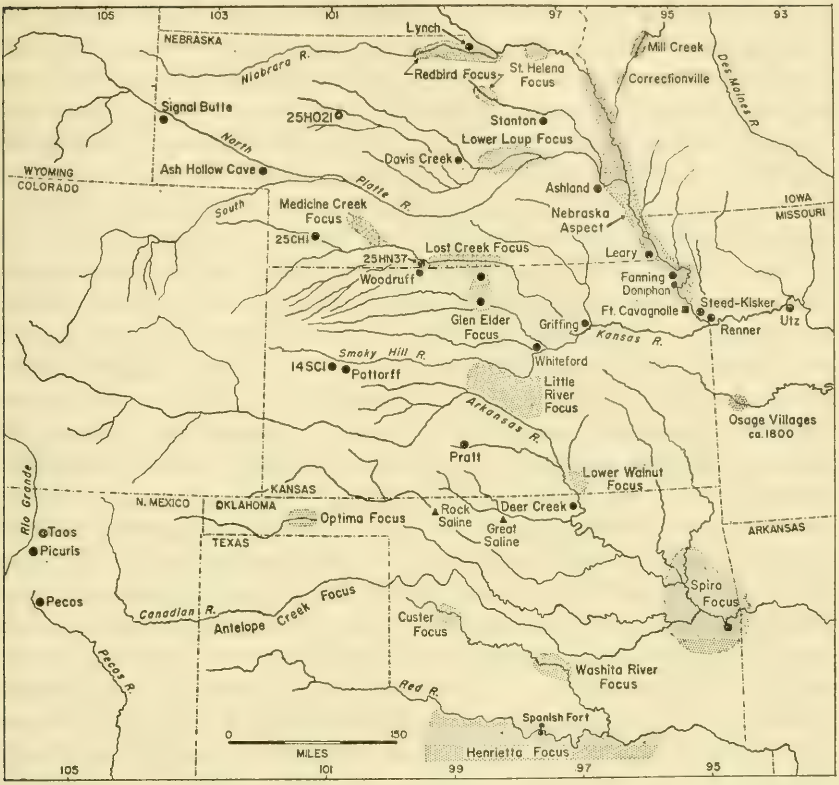
105
103
101
97
95
93
NEBRASKA
Lynch
Mill Creek
Niobrara R.
Redbird Focus
St. Helena Focus
Correctionville
Des Moines R.
Signal Butte
25HO21
Stanton
North
Lower Loup Focus
Davis Creek
WYOMING
COLORADO
Ash Hollow Cave
Platte R.
Ashland
IOWA
MISSOURI
South
Medicine Creek Focus
Nebraska Aspect
25CH1
Lost Creek Focus
25HN37
Leary
Woodruff
Fanning
Doniphan
Steed-Kisker
Ft. Cavagnolle
Glen Elder Focus
Griffing
Utz
Renner
Kansas R.
Smoky Hill R.
14SC1
Pottorff
Whiteford
Little River Focus
Arkansas R.
Osage Villages ca. 1800
Pratt
Rio Grande
Lower Walnut Focus
KANSAS
N. MEXICO
OKLAHOMA
Rock Saline
Deer Creek
Optima Focus
Great Saline
ARKANSAS
Taos
Picuris
TEXAS
Spiro Focus
Pecos
Focus
Canadian R.
Antelope Creek
Custer Focus
Pecos R.
Washita River Focus
Red R.
Spanish Fort
0
150
MILES
Henrietta Focus
105
101
99
97
95

FIGURE 105.—Map showing location of certain Central and Southern Plains archeological sites and complexes.

spreading refuse mounds scattered in random fashion over areas of 3 or 4 up to 40 or more acres. Among these middens, and apparently under many of them, there are usually abundant cache or storage pits. On some sites, these are present by the hundreds; and they may run to considerable size. Characteristically, they have undercut sides and a bell shape, with constricted neck and a flat or slightly concave floor. Examples have been found with floor diameter of 7 or 8 feet and depth of 8 to 10 feet. Shallow depressions up to 20 feet in diameter and not over 6 to 12 inches deep suggest house ruins; but this identification lacks verification by excavation, and we have no actual indication of the house type. Other than the numerous middens and the small elevations associated with the "council-circle" complexes, there appear to be no mounds on the Little River sites. Larger mounds that may be planned constructions occur on at least one Lower Walnut Focus site, but their true nature remains obscure. I know of no evidence of fortifications, stockades, or ditches at any of the Great Bend sites, nor of any associated burials or burial grounds.

A notable feature of several of the Little River Focus sites is the presence of what, for want of a better name, have come to be known locally as "council-circles." Their nature and purpose remain more or less obscure, despite extensive tests made by our party in one such complex at the Tobias site. They may be described as consisting of a wide shallow ditch some 30 to 60 yards in diameter, with a mounded center. In some cases, as at the Hayes site (14RC3), the ditch appears to have been continuous, with a present depth of 12 to 18 inches and width of 12 to 15 feet, and with a well-marked raised center consisting in part of ash and refuse. In others, as at Tobias and the Paint Creek site, the ditch is discontinuous, consisting of a roughly circular arrangement of five or six shallow elongate depressions of varying length and without visible central elevation. These complexes have been noted on at least three sites in Rice County, all within a mile of one another, and at the Paint Creek site (Wedel, 1935, p. 240); and I once noted what appears to have been a somewhat similar arrangement of depressions at the Swenson site on Sharps Creek. No known village site has more than one of these features, and not all sites have them. They have not been reported at any of the Lower Walnut Focus sites in the Cowley County area; but it is possible that long-continued cultivation on the sites we saw has blurred their traces. Our findings in the mound 17 complex at Tobias, including discovery of postholes, firepits, caches, and burnt wattle-impressed clay in two basins adjacent to parts of a discontinuous ditch system, would indicate that some sort of structures once stood here. I am indebted to Dr. J. R. Swanton, formerly of the Bureau of American Ethnology, for the suggestion that these remains may represent the sites of temples or ritual centers analogous to the community centers in Caddo villages. One wonders if the larger earthen mounds at the Arkansas City Country Club site were perhaps temple platforms or otherwise served as comparable ritual centers for their local community.

In comparison with most earlier culture complexes of the Kansas region, the Great Bend Aspect has a relatively rich and varied artifact inventory. Broken pottery is plentiful at most of the major sites, especially subsurface; and through excavation, we have a good deal of information on the principal characteristics of the ceramic complex here represented. For the most part, the pottery is of mediocre quality and suggests the product of a decadent industry or, alternatively, perhaps a heavy emphasis on strictly utility wares. In the Little River Focus sites of Rice and McPherson Counties, 95 to 98 percent of the ware is grit or sand tempered, the inclusions ranging from fine to medium in size and usually being present in generous quantities. At Cowley County sites of the Lower Walnut Focus, shell tempering is decidedly predominant, constituting about 99 percent of our sample. Vessel surfaces, usually brown to gray or black in color, were unevenly smoothed, especially on the interior; and there is little or no evidence of polishing or burnishing. From 60 to 89 percent of body sherds in Little River sites have plain surfaces (type Geneseo Plain); and 10 to 40 percent show parallel ridges produced by stamping with grooved or thong-wrapped paddle (type Geneseo Simple Stamped). On the shell-tempered Lower Walnut pottery, virtually all sherds are plain surfaced (type Cowley Plain). Incised, trailed, or other neck or body decoration is very scarce; but decorative effects of a sort were sometimes achieved on Little River pottery by the addition of fillets, plain or diagonally incised, below the rim, or by rows or groups of small applique nodes. A small proportion of Little River sherds have cord-roughened exteriors (type Little River Cord Roughened (Smith, 1949 a, p. 295)); and another small group includes pieces with a red-painted surface (type Geneseo Red Filmed).

The usual vessel form is a medium to large jar, from 20 to 40 cm. tall and slightly less in maximum body diameter, with simple vertical or slightly outcurved rim, constricted neck, rounding shoulder, subconical or globular underbody, and rounded or flat base. No other forms have been recognized in Little River pottery of the grayware series (types Geneseo Plain and Geneseo Simple Stamped); but globular small-mouthed vessels are suggested in Geneseo Red Filmed ware. The Lower Walnut complex apparently includes some deep round-bottomed bowls; and probably some miniatures belong to both foci. Flat disk bases are much more plentiful in Lower Walnut than in Little River sites; at the latter, there is some evidence that they may correlate with the rare shell-tempered pottery. Vertically placed loop or strap handles, two per vessel and usually attached by tenoning, commonly connect the neck and upperbody. Here again focus differences seem to be indicated, with the Lower Walnut pottery including a significantly higher proportion of handles of all kinds. In both foci, the handles sometimes have a small nipplelike or laterally compressed protuberance in the upper, lower, or both angles of attachment; and small perforate or imperforate lugs sometimes are found. Vessel rims are usually unthickened and unspecialized; those from the Little River Focus tend toward higher straight forms; and in both foci thickening at the lip occurs only where the lip has been decorated. About 40 to 60 percent of Little River rim sherds and roughly 30 percent of Lower Walnut rim sherds bear small incised diagonal or punctate units or finger-impressed scalloping on the lip.

The presence of exotic sherds on some Great Bend Aspect sites should be noted here. Most abundant, perhaps because they are more readily distinguished from local and other Plains wares, are Southwestern sherds. It will be recalled that late Rio Grande glaze pieces were found by our party at the Thompson site (Little River Focus) and also at two sites of the Lower Walnut Focus. Smith (1949 a, p. 295) reports surface finds of Late Glaze E or F pottery at the Hayes site (14RC3), and of Late Glaze C to Early D sherds from Spriggs Rocks (14RC1), the latter group unfortunately without associated local types. From the Tobias site there is a sherd of Chupadero Black on White; and an incised tubular clay pipe fragment reminiscent of some of the late pipes at Pecos was recovered at the Thompson site. Contacts in a different direction are indicated by several red-filmed sherds from the Thompson site which suggest effigy pottery from the Arkansas-St. Francis region; and downriver relationships are also hinted at by engraved sherds and by others with fingernail indentations from the Larcom-Haggard and Arkansas City Country Club sites, both assigned to the Lower Walnut Focus. The sherd with trailed body decoration and cloistered rim found by Udden at the Paint Creek site (Udden, 1900, fig. 10) points in still another direction. Paste and tempering pretty certainly indicate local manufacture, but the decoration and rim treatment are typically Lower Loup (Wedel, 1935, p. 246) in all respects.

Continuing our inventory of Great Bend material culture, we note next the abundance and variety of stone and bone artifacts. Chipped stone is especially plentiful, ranking next to potsherds in quantity. Planoconvex end scrapers are very common; most are small to medium in size, and practically all have been carefully shaped and finished. Almost equally plentiful are side scrapers in a variety of forms and sizes; single-edge retouching is the rule but there are many exceptions. Bifacially chipped knives include unbeveled elliptical, ovate, or oblong-rounded forms; and also many specimens with two or more alternately beveled edges. Slender two-edged knives with a pair of shallow notches opposite each other above a rounded, pointed, or occasionally flattened, base are the most common form; and there is evidence also of lanceolate and lozenge-shaped pieces. Projectile points are generally small, basically triangular, and always well made; unnotched forms are decidedly predominant over notched. There are a few cruder leaf-shaped, subtriangular, and stemmed points; and from the Tobias site came a series of large triangular notched specimens duplicating in every respect but size the minority type. Drills are also plentiful and include several forms. At most sites, expanded-base drills in which a fairly slender shaft widens abruptly to a large basal flange, are predominant. Plain-shafted medium to heavy drills, occasionally with one end worked to a definite stem, were especially abundant at Tobias, but occur elsewhere also. Large coarsely chipped ovate to subelliptic choppers are found at most sites, but not in great numbers. They sometimes have broad shallow notches that suggest places of attachment for a handle. Excepting the choppers, the chipping on all these implements was usually done with care and skill, and the industry compares very favorably with that in any ceramic horizon of the Plains. Many of the artifacts were fashioned from banded fossiliferous Florence flint, a colorful and attractive stone obtained in the southern Flint Hills. Chert, chalcedony, agate, and other stone was also employed, and there is a little obsidian from New Mexico or elsewhere to the west.

Ground and pecked stonework also occurs in considerable amount. Grooved mauls are present in a variety of sizes and shapes, ranging from beautifully fashioned cylindrical specimens with flanged groove to slightly altered cobbles whose principal modification is a shallow, sometimes discontinuous, groove for hafting. They include most of the large and small forms that have been variously described as stake drivers, pemmican pounders, and club heads. Milling slabs or metates up to 26 inches in length are of two general kinds; some have an elliptical depression on their upper surface resulting from a rotary grinding motion whereas others are flat-surfaced and surely indicate a to-and-fro action. One- and two-hand manos are present, as are discoidal or bun-shaped grinding or rubbing stones. Particularly plentiful are fragments of shaped longitudinally grooved sandstone shaft smoothers of the type generally used in pairs. Rectangular or variously shaped blocks of sandstone with irregular, incomplete, or crisscrossed grooves doubtless served for sharpening awls or other small pointed implements. There are occasional deeply grooved blocks of limestone which I take to be shaft polishers; others, also of fine-grained stone and with numerous grooves irregularly disposed along their edges, may be sinew-stones. Pipes are almost always of stone and occur in several varieties. Highly typical is an L-shaped pipe with tall cylindrical or slightly bulbous bowl and a short stem. Much less common are a low bowled form with projecting stem and a simple tubular form. Some of these pipes are almost certainly of catlinite; more are of a very fine-grained red sandstone that is easily mistaken for the Minnesota stone; and I have seen at least one tubular specimen of steatite or a closely related material. Perforate and imperforate sandstone disks up to about 3 inches in diameter and of uncertain use came from the Tobias site, as well as various concretions and pseudomorphs. The sandstones and limestone used by the Great Bend peoples were probably available at no great distance; but the Sioux quartzite and other tough crystalline stone used for mauls was evidently carried in from the glaciated region of northeastern Kansas. Catlinite and turquoise were clearly imported; and so, probably, were two greenstone celts found at the Elliott site in Cowley County. A cupstone from this site may also be a trade piece. Hematite and ocher occur everywhere as pigments.

Work in bone includes numerous bison scapula digging tools at all sites, but with noteworthy focus variations. In the Little River Focus, the great majority have had the distal extremity or head of the scapula removed. In the Lower Walnut specimens, much or most of the head remains and there is either a socket bored from the glenoid fossa into the neck of the bone or else a deep groove runs down the dorsal surface of the scapula. This suggests, of course, different methods of hafting, the Lower Walnut specimens evidently having been mounted in a fashion similar to the socketed digging stick heads and scapula hoes of certain Oklahoma-Texas culture complexes. Awls are of several types, the most common being those fashioned from the edge of the neural spine of the bison and having a triangular or circular cross section. Flat awls split from large mammal ribs are next commonest in Little River sites, but we found none of these in the Lower Walnut area. Awls of split mammal legbone occur everywhere, but in relatively small numbers. Large pointed daggerlike objects of split rib occurred in Little River sites, but not in Lower Walnut. Bison rib arrowshaft wrenches were found by us only in the Little River area; but two made of deer tibia came from the Elliott site in the Lower Walnut district. Transversely scored mammal ribs ("musical rasps" or "tallies") occurred several times in each focus, as did wedge-shaped paint applicators and other objects of cancellous bone, and tubular beads. Hide dressers made of bison epiphyses are present. The metapodial flesher with serrate or smooth blade was not found by us at any of the sites; I picked up the serrate tip of one at a putatively Great Bend site near Larned, but present evidence suggests that the type was rare at or absent from most sites. Probably to be included in the Great Bend inventory, though we found them exclusively at the Tobias site, are a number of well made and variously shaped four-sided, tapered cylindrical, and cylindrical stemmed objects, all presumably representing projectile points, and several smaller bipointed implements. Short blunt awls or polishers, with triangular cross section and evidently fashioned from rib edges, recur at nearly all sites. Worked bison hyoids came from two Little River sites, gaming chips (?) and incised slips of bone only from Tobias.

Worked antler was found only at the Tobias site. It includes especially the following: carefully shaped partially hollowed scooplike tines, a conical socketed projectile point, a dressed and socketed basal section (handle?), a small transversely scored and perforated rodlike object, and a number of narrow strips with bored and/or notched ends. Eyed pieces that may be needle fragments were found at both Tobias and Thompson. I venture the suggestion that if and when properly controlled and systematic excavations on a really adequate scale are undertaken at other sites, especially in and around some of the "council-circle" complexes, many of the types that now appear more or less unique to Tobias may prove to be present at other sites as well.

Objects of shell are somewhat more plentiful at Great Bend sites than in other Central Plains complexes, but again most of our specimens come from the "council-circle" complex at Tobias and only further work will show how truly representatives the sample is. Included are disk beads, whole and cut shell pendants, spoons or scrapers, a notched shell, and two tapered imperforate objects. With possible exception of the disk beads (*Olivella?*), all worked shell appears to be of fresh-water species.

Articles of wood and other perishable substances were, of course, scarce in all our excavations. In fact, the little evidence we have of work in these materials we owe to the conflagration that destroyed whatever structure once stood in basin 2, mound 17, at the Tobias site. Of especial interest is the coiled basket or tray, constructed on a single-rod foundation and presumably used as a container for shelled corn. There was also a small piece of twisted two-ply grass or shredded cornhusk cordage. A few small rods suggesting arrowshafts and several small slips of cut wood complete the list.

Finally, we must note briefly the non-Indian objects that, as gifts, trade goods, or otherwise, originated with white men. Iron objects, either as scrap or as identifiable items, came from three Little River Focus sites. What was evidently a double-pointed awl and an ax blade came from Tobias, and several bits of chain mail from Thompson. Rolled tubular copper or brass beads were also recovered at Tobias, as were the remains of a necklace composed in part of about 150 blue glass beads. There are no White contact materials in our collections from Cowley County (Lower Walnut Focus).

As any close student of Plains archeology will realize by this time, the Great Bend Aspect traits listed in the foregoing pages include a good many that occur widely throughout the Central Plains, particularly among the semisedentary cultures on the late prehistoric and protohistoric time level. Relatively few features in its inventory can be shown to be limited to Great Bend. The "council-circle" complex is certainly one of these and perhaps the most noteworthy; the pottery complex is another. High-bowled L-shaped stone pipes, in the Central Plains at least, can be regarded as distinctive of Great Bend; and so, apparently, can hollowed scooplike antler tines and perforated sandstone disks. I am inclined to think that stemmed and four-sided bone projectile points are much more plentiful in

Great Bend than in neighboring cultures to the east, north, and west; and the chipped stone industry likewise seems more prominent and advanced. The Great Bend peoples, as judged by our finding of well-developed ears of corn, of numerous large storage pits, of scapula hoes, and of the metate-mano complex, were certainly more advanced horticulturists than were those of the Dismal River Aspect, discussed in more detail in the next section; and they probably ranked in this respect close to their Pawnee kindred of the Lower Loup Aspect in east-central Nebraska.

The pottery of the Great Bend Aspect, considered as a whole, is readily set apart from any other in the Kansas region; and it is also fairly distinct from other ceramic complexes of the Central Plains. It should be pointed out, however, that a good many plainware body sherds from Little River Focus sites are not easily distinguishable from some of the Dismal River sherds we collected at 14SC1 in Scott County. As a complex, the Scott County variant of Dismal River pottery differs from Great Bend pottery in the general absence of simple stamping, of vessel handles or lugs, of lip decoration, and of flat vessel bases. The generally darker color, inclusion of mica flakes, and smaller sherd size of Dismal River pottery are less trustworthy criteria for distinguishing between the two complexes. As regards vessel shapes, it should be noted that the one restorable vessel from 14SC1 (pl. 68, *b*) fits about as well into the Little River series as it does into the one extant group of Dismal River vessels—that reported by Hill and Metcalf (1942, pls. 5 and 6) from the Lovitt site.

The resemblances between Dismal River and Great Bend extend to other categories of their culture besides pottery, representing in part actual intercourse between the two groups and in part joint participation in widespread Plains practices and customs. Shared nonpottery traits include small triangular notched and unnotched projectile points, end and side scrapers, a similar variety of chipped knives and drills, paired sandstone shaft smoothers, grooved mauls, grinding stones, scapula hoes, stemmed bone projectile points, rib wrenches, a similar variety of bone awls, cancellous bone paint applicators, epiphyseal hide grainers, tubular bone beads, and rare tubular stone pipes. Also in both are very limited amounts of White and Southwestern trade or other contact materials.

The Great Bend Aspect also shares a number of traits with the Lower Loup Focus (protohistoric Pawnee) in east-central Nebraska. Here detailed comparisons are impossible except on very limited scale, since only a small fraction of the Lower Loup materials available in Nebraska have been published in the desired detail (Dunlevy, 1936), and there are otherwise only generalized and certainly incomplete trait lists extant (Strong, 1935, p. 68; Wedel, 1938 c, pp. 6–9).

With respect to pottery, the Lower Loup wares have been described as grit tempered; and examination of several small site samples in the United States National Museum suggests that there is perhaps less tempering than in most Little River Focus pottery, but with more frequent occurrence of large sand grains or crushed silicious particles. Shell tempering, which predominates at Lower Walnut sites, is very much in the minority at Lower Loup sites. Lower Loup vessel forms show some similarities to those of Great Bend; but they present much more variety and the large jars tend strongly toward a more globular form as contrasted to the often vertically elongate shapes in Great Bend. Simple stamping is far more characteristic of Lower Loup, as are handles in a wide variety of shapes and sizes. Much of the Lower Loup utility ware is relatively simple and plain, and sherds from such pottery would probably parallel closely much of the Great Bend ware. In addition, however, Lower Loup includes many rims that are elaborated into thickened or collared form with incised or punctate decoration on the rim exterior, frequent lip decoration, ornately done handles, and incised or trailed vessel bodies. These features, other than lip decoration, are absent from Great Bend pottery. The attractively done cloistered rims from such Lower Loup sites as Burkett, Gray, and Barcal are likewise generally absent from Great Bend. That there are some general relationships between the pottery wares of the two areas is evident. The Great Bend potters, however, seldom progressed beyond the strictly utilitarian, whereas those of the Lower Loup went on to a more varied and artistic series of creations.

In the matter of nonpottery traits, Great Bend and Lower Loup apparently share the following: abundance of small triangular unnotched projectile points; numerous end and side scrapers; a variety of unbeveled and beveled knives; several kinds of chipped drills; grinding stones (the metate-mano complex rare or absent in Lower Loup); paired sandstone shaft smoothers; grooved mauls and clubheads; sandstone hones or sharpening blocks; stone elbow pipes with low bowl and projecting prow-like stem; abundant scapula hoes, not socketed in Lower Loup; stemmed bone and socketed antler tip projectile points; a similar variety of split-rib, "rib-edge," and split mammal legbone awls; short blunt awls or polishers with subtriangular or round cross section; bison rib wrenches; transversely scored bison ribs ("musical rasps"); wedge-shaped cancellous bone paint applicators; epiphyseal hide grainers; bison ulna picks; narrow slips of antler or bone, bored and/or notched at one end; tubular bone beads; perhaps serrate-bladed metapodial fleshers; catlinite; and limited work in shell. Non-native traits shared include small amounts of White contact goods. Conspicuous differences that may be noted here include absence at Great Bend sites of the remains of the circular earth lodge, of any evidence of fortification of the communities, and of burials. Precise determination of the actual nature and extent of similarities and dissimilarities between the two cultures must await fuller publication of data on the Lower Loup complex and its variations.

Southward, the Great Bend Aspect shows a number of resemblances to certain late prehistoric complexes in central Oklahoma and northern Texas. In Oklahoma (Bell and Baerreis, 1951, pp. 75–83), the similarities appear to be closest with the Washita River Focus in Garvin and Grady Counties (Schmitt, 1950; Schmitt and Toldan, 1953), less so with the more westerly Custer Focus in Custer County (fig. 105). Sites of the Washita River Focus are situated on streamside terraces or upland promontories; like those of Custer Focus, they are marked by accumulations of cultural detritus, remains of square houses, and cache pits. In both complexes, the subsistence economy was based on hunting and on maize-bean horticulture, as in the Great Bend Aspect. There are socketed bison scapula hoes, shaft wrenches of mammal leg bone, transversely scored bones ("musical rasps"), tubular bone beads, leaf- and diamond-shaped beveled knives, longitudinally grooved sandstone shaft smoothers, ground stone celts, split-rib awls, metates and manos, end, side, and flake scrapers, and use of Kay County fusulinid flint for chipped objects—all reminiscent of the Great Bend Aspect, and particularly of the Lower Walnut Focus. Plain pottery predominates in both of the Oklahoma foci, but with some cord-roughened sherds also present; shell tempering is present in Washita River Focus, often with limestone, sandstone, and bone. Flat disklike bases occur in both foci, along with occasional handles, lugs, and applique features; and these items, along with the Custer Focus vessel forms described (Bell and Baerreis, 1951, p. 83) as "deep conical jars which may have a small rounded or flattened base," are also reminiscent of Great Bend traits.

There are also some notable differences between the Oklahoma and Kansas materials. Present in the former but missing in the Great Bend inventory are the following: square houses with four center posts, central hearth, extended entryway, and earth or wattle covering; hoes of bison frontal bone with horn core handle; socketed bison metapodial digging stick heads; rib and deer metapodial beamers; bone fish hooks; deer antler headdresses; small figurines, elbow pipes, and perforated disks of clay. Conversely, the Oklahoma complexes apparently lack the following Great Bend items: grooved mauls and hammers; two-edged side-notched chipped knives; high-bowled L-shaped stone pipes; sandstone disks; "rib-edge" awls; wedge-shaped cancellous bone paint applicators; stemmed and four-sided bone projectile points; conical antler tip projectile points; and hollowed scooplike antler tine implements. Noteworthy, too, is the fact that no European contact materials have been reported from either the Washita River or the Custer Focus sites; and this, together with some of the trait differences noted above, suggests that the Oklahoma complexes under consideration probably date from a somewhat earlier time period than do the sites on which the Great Bend Aspect has been set up.

Farther to the south, we must consider the Henrietta Focus of north-central Texas, which may also be somewhat earlier in time. Krieger (1946, pp. 148–154) has already discussed this matter with insight and in some detail; but his observations were made before completion of my analysis of the Great Bend materials and some further comment is called for here. As Krieger notes, the house type for neither culture is known. Both, however, followed a subsistence economy divided between maize horticulture and hunting, with some fishing indicated in Henrietta. Both, likewise, had a rather extensive and varied chipped stone industry, with many, but by no means all, artifact types in common. The shell-tempered Nocona Plain potteryware of Henrietta, which includes some flat-based jars, is certainly remindful of the Cowley Plain pottery in the Lower Walnut Focus; and the socketed bison scapula hoes are another point of similarity. To the list of shared traits given by Krieger (1946, p. 150) can now be added several more, including the following: back and forth grinding on shaped flat slabs (metates); two-hand manos; sandstone hones; hematite blocks with scraped and polished faces; thick greenstone celts with rounded polls; and Chupadero Black on White trade sherds. Beyond this, the respective trait inventories diverge, with Great Bend exhibiting generally much less similarity to Henrietta than it does to Lower Loup, Dismal River, and perhaps other protohistoric Central and Northern Plains manifestations.

A good many of the material culture items inventoried for the Great Bend aspect occur also in late prehistoric and early historic phases of the sequence in the northeastern Pueblo area of New Mexico. Thus, at Pecos, from which an exceptionally complete and admirably described series of artifacts of this period has been published (Kidder, 1932), such items as chipped end scrapers, side scrapers, beveled knives, rib wrenches or shaft straighteners, cancellous bone paint applicators, and humerus-cap (epiphyseal) hide grainers, are considered indicative of relationships with Indians to the east, that is, in the Plains. For the most part, where stratigraphic provenience could be established, these types were found at Pecos in greatest frequency, and in some cases exclusively, in late Glaze III to Glaze V context (ca. A. D. 1500–1700). Well-chipped end scrapers, side scrapers, and beveled knives, as we have noted, are all very common in Great Bend sites. Here, however, the two-edged beveled knives often have well-finished round or pointed bases and lateral notches, which are not evidenced on the illustrated Pecos specimens. The four-edged knives from Pecos and the two "exceptional specimens" (Kidder, 1932, p. 34 and fig. 16) would not be out of place in the series of chipped artifacts in our Great Bend series; and the plain shafted heavy drills with edges "ground so smooth in service that they have an almost water-worn appearance," the expanded base drills, and the occasional scraper-drill combination, are also found in Great Bend. There is, in fact, a rather striking similarity between the chipped stone illustrated and described by Kidder from Pecos and our collections from the Great Bend Aspect sites of central Kansas. Other shared items include: the metate-mano complex; sandstone shaft smoothers or rasps; three categories of awls, fashioned respectively from flat sections of split rib, from rib or neural spine edge splinters, and from dressed mammal leg bone; four-sided projectile points, and others with stems; blunt awls or polishers, subtriangular in cross section; tubular bone beads; and transversely scored implements or "sounding rasps" of bison rib. Further work in Great Bend sites may show, though ours did not, that the serrate-bladed metapodial flesher should be added to the list.

Most of the shared traits enumerated in the foregoing paragraph are found also in other protohistoric Plains complexes, as we have already noted, and are not peculiar to the Great Bend aspect. Their occurrence at Pecos and elsewhere along the eastern periphery of the Pueblo area thus indicates contact between Pueblo and Plains cultures, but not necessarily between the Great Bend peoples and those of the Southwest. Yet there were certainly some direct contacts here, since peculiarly Southwestern elements occur in Great Bend sites. These include Rio Grande glaze paint pottery, turquoise, fine-grained arrowshaft straighteners or polishers, probably obsidian, and very likely occasional incised tubular pottery pipes.

The general chronological position of the Great Bend Aspect has, I think, been acceptably determined. In considerable measure, this determination rests on the recurrence in and on Great Bend Aspect sites of datable Southwestern potsherds. As scattered surface finds, and occasionally as a result of random digging, such materials have been gathered for many years at various locations on Cow Creek and Little Arkansas River in Rice County, and on Grouse Creek in Cowley County. Among the Rice County finds (Wedel, 1942, p. 6) are Rio Grande glaze paint sherds of Mera's Group C, which was "in style for a short time during the last half of the 15th century" (Mera to Wedel, letter of August 13, 1940). Others, including a number of sherds recovered by my 1940 United States National Museum party from pit 2 and mound 2, Thompson site, from pit 14, from mound 17, and on the surface at Larcom-Haggard, and from pit A, mound 1, at the Arkansas City Country Club site, have been identified by Mera as of his group E and by Kidder (letter of May 6, 1941, to Wedel) as glaze IV; both agree that the sherds should be assigned to the period 1525–1650, and Kidder "would prefer to place them prior to 1550." At the Tobias site, we recovered one sherd of Chupadero Black on White, a long-lived type (13th to 17th century) described by Mera as of little use for close dating. It will be recalled that Smith (1949 a, p. 295) surface-collected at the Hayes site (14RC3) a "Pueblo sherd associated with Great Bend pottery. It is of Rio Grande glazed ware, Late Glaze E or F, dating from the 17th century"; and that he made another collection of Pueblo sherds, but without local pottery associations, at Spriggs Rocks (14RC1), these being identified as "Late Glaze C to Early D, characteristic of the Galisteo Basin and dating from the pre-Spanish portion of Pueblo IV." Sherds from Grouse Creek, presumably surface-collected, were identified by Mera (letter of May 8, 1946, to Wedel) as Pojoaque Polychrome, an early 18th century ware.

These exotic pieces, then, range through a time span running from about the last half of the 15th century to the early 18th century. Those we excavated ourselves and whose exact provenience is known are all from the more limited period, 1525–1650. In all cases, the puebloan pieces occurred in or on sites, or else in sherd areas, certainly or very probably attributable to the Great Bend Aspect. This recurrence at widely separated Great Bend Aspect sites of Pueblo sherds centering around 1525–1650 is strong evidence that these communities were flourishing during the 16th and 17th centuries—that is, during the period when the Spanish were exploring the upper Rio Grande valley and working outward into the Plains toward the northeast. The scant traces of White contact we found in two sites in Rice County, including bits of chain mail, are what might be expected in communities existing at the very beginning of such an exploration period. In other words, it seems in the highest degree probable to me that some of the Little River Focus sites were inhabited when the first mid-16th century Spanish explorers reached the region; and I consider it quite likely, further, that such sites as Malone, Tobias, Thompson, and Paint Creek were among the Quiviran villages actually visited by Coronado and his men in that memorable summer of 1541.

There is, of course, another facet to this problem of chronology, namely, the matter of time perspective within the aspect itself. The wide range in time—some two and a half centuries—represented by the puebloan sherds suggests that there may be some sites that predate the arrival of the Spanish, and others that followed the initial contact. I realize fully that some of the Southwestern sherds may have come into central Kansas long after their manufacture on the Rio Grande and thus do not necessarily date the sites in or on which they were found. Still, there are numerous sites in the Great Bend Aspect and probably not all were simultaneously inhabited. More extended field investigation and, of course, meticulous laboratory analysis of materials, will be required before we can be sure which were early and which late.

It is not even clear at the moment which focus—Little River or Lower Walnut—has priority in time over the other. Smith (1949 a, p. 295) has suggested that the Major and Thompson Creek sites may date from pre-Coronado times since no European contact materials were found at either in course of his investigations. On this basis, the sites on which I have established the Lower Walnut Focus must also be considered pre-White, despite our finding there of puebloan sherds datable to the 1525–1650 period. Our work in Cowley County, however, was much more limited in scope than that in Rice County, and I am by no means convinced that we have adequate grounds for judging time relationships as between individual sites. Some 60 years elapsed between Coronado's entrada into Quivira and that of Oñate; and after the latter, there were other long interludes between visits to the Great Bend area by Europeans. Thus, trade or other White materials must have been extremely scarce in central Kansas for some time after Coronado; and at sites inhabited mainly or entirely during one of the intervals between European visits, there may be little or nothing to indicate that such contacts had taken place.

With reference to our immediate problem—time perspective within the Great Bend Aspect—I can offer only tentative suggestions which are highly impressionistic. I am inclined to believe that the Little River and Lower Walnut Foci were in part contemporaneous, as the exotic Rio Grande glaze paint sherds suggest; and that both were probably flourishing during the Coronado-Oñate period. I suspect, however, that Lower Walnut may have persisted later than Little River, and that it was perhaps the source of the shell-tempered sherds we found at the Scott County Dismal River site, 14SC1, for which a late 17th- or 18th-century date is otherwise indicated.[48] In part, Lower Walnut may represent in its later stages a southward drift by the people represented in Rice and McPherson Counties by the Little River Focus sites. Whether any of the Little River Focus sites actually go back to an earlier time than any of the Lower Walnut sites, I am not prepared to say. Neither can I suggest when, where, or by what mechanism the Little River Focus peoples, assuming they did drift southward in or soon after the 17th century, changed from the Geneseo sand-tempered to the Cowley shell-tempered potterywares. Probably the answer to this and other intriguing problems lies in some of the many yet undug sites scattered through the Great Bend lowland of central and southern Kansas.

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[48] Several thickly shell-tempered sherds, including parts of a flat disk vessel base, were recovered in 1930 from house 1, Gray site (see Dunlevy, 1936, fig. 6), 2 miles north of Schuyler, Nebr., by a University of Nebraska Archeological Survey party under my field supervision. These were recognized at the time as unusual in the local (Lower Loup) complex. I now believe these pieces originated somewhere in the Great Bend region of Kansas, perhaps as far south as the Lower Walnut Focus sites.

Acceptance of a general mid-16th century dating for the Great Bend Aspect sites we investigated brings us to my final point here—the identity of the people who were responsible for it. On this point I have already set forth my views elsewhere (Wedel, 1942), and I have found nothing since that impels me to alter that position. Briefly, I hold that what we know of the distribution of the sites and of their basic cultural uniformity indicates that they were the habitat of a widespread and numerous semisedentary people practicing a maize-bean-squash horticulture, along with much hunting, some gathering, and perhaps a little fishing. There is evidence in the chain mail fragments, iron, brass, and glass beads of limited White contact. Turquoise, obsidian, glaze-paint sherds, and probably other items indicate relationships with Pueblo groups of the mid-16th century on the upper Rio Grande. Viewed in light of the ethnohistorical data presented elsewhere in this paper (pp. 60–62), the archeological and geographic evidence at hand sustains my conviction that the Quivira of the 16th- and 17th-century Spanish documents and the sites of the Great Bend Aspect were the habitat of one and the same people. These were in all likelihood the Wichita. It is gratifying to note that Bolton (1949, pp. 291–295), who painstakingly retraced the route of Coronado, has also identified as Quivira the sites classed herein as the Little River Focus of the Great Bend Aspect. In this identification, it is only fair to note, both of us were anticipated more than 20 years ago by a "country editor" in Lyons, Kans. (Jones, 1929).

The archeological remains we have discussed in this section comprise one of the most distinctive and noteworthy manifestations of native Indian culture in Kansas. Before we move on to the review of other complexes, it may be of some interest to consider briefly what can be inferred from the archeological evidence regarding the Great Bend way of life. The Little River Focus peoples occupied unfortified villages, some of considerable extent, scattered chiefly along Cow Creek, Little Arkansas River, and other small streams north and east of the great bend of the Arkansas. The Lower Walnut peoples lived in large rambling communities, also without defensive works, on or near the immediate banks of Walnut River, and probably on smaller streams in south-central Kansas. The number of persons in these settlements is uncertain, but some of them must have included several hundred individuals. There is no evidence that they used the semisubterranean earth lodge, although the "council-circles" of the Little River district apparently include the remains of some sort of specialized semisubterranean partly earth-covered structures. The common type of dwelling must have been of perishable materials in a surface or very shallow subsurface construction. The grass houses noted by Coronado in Quivira would qualify nicely here.

Subsistence was primarily by horticulture, secondarily by hunting, with gathering and fishing of less importance. Corn was certainly known and included highly developed varieties with well-shaped good-sized ears bearing 10, 12, and more rows of kernels; it was cultivated in the creek or valley bottoms, with the bison scapula hoe as the principal tool. We may suppose that beans, squash, sunflowers, and perhaps other crops were also grown, though of these there is no direct evidence. Crop surpluses, which were probably considerable, were stored in large underground pits which, when no longer needed or suitable for storage, were used for the deposition of rubbish. Corn was reduced to meal by means of mealing slab and mano; and from the length and size of some of the latter it seems evident that they were held in both hands and used with a to and fro motion, as among the Pueblos. Hunting was also extensively carried on, with the bison as the principal game and the bow and arrow the chief weapon; whether the lance was in use is not certain. Birds apparently formed a relatively small part of the bill of fare; but in the Lower Walnut sites the turkey, which must have abounded in the wooded ravines and scrub oak cover to the south, was of some importance. There is a little evidence of twisted cordage and coiled basketry in the Little River Focus. Heavy reliance on skin dressing can be inferred from the numerous knives, scrapers, light flint drills or perforators, and bone awls. Wedge-shaped cancellous bone objects, if used as paint applicators as in historic times, suggest gaily ornamented parfleches, tipi covers, and the like. The use of skin clothing may also be inferred, but there is only meager evidence—bone beads, long slender polished tubes, a few shell pendants, turquoise, and red and yellow pigments—to suggest the character of personal adornment.

Household utensils, in addition to items already mentioned, further included pots and bowls of a rather drab potteryware, grooved mauls, choppers and hafted axes of chipped stone, shell scrapers, perhaps also rare ground stone celts and cupstones. The sounding rasp, made of wood among the historic Wichita, may be indicated by some of the notched or grooved bison ribs. Technology in some lines, as for example, stone chipping, was of fairly high order, that in bone perhaps less so; and shell working was relatively unimportant. For much of the chipped stone, use was made of an attractive banded fossiliferous Florence flint from the southern Flint Hills, this stone being carried in quantities as far north as Rice County; and Sioux quartzite from the drift area of northeastern Kansas was utilized in making mauls and other heavy duty implements.

Concerning the ceremonial, sociopolitical, and other nonmaterial aspects of culture there is little evidence. Specialized structures are indicated for some Little River sites; mounds in the Lower Walnut area may also have been erected for some ritual purpose or as temple foundations. The burial grounds which might offer some clues to social distinctions and other matters remain undiscovered. Pipes, probably used with tobacco, may have had a ceremonial use. That there was a fairly lively intercourse with peoples in remote regions is indicated by presence of glaze-paint pottery, turquoise, and obsidian from the upper Rio Grande, punctate and engraved pottery from Arkansas or eastern Oklahoma, and catlinite from Minnesota. Not all of these contacts were necessarily direct, but they indicate that the people of the Great Bend Aspect were not solely dependent on the resources of their immediate neighborhood.

As to the physical appearance of the people, and their resemblances and relationships to their neighbors and trading partners, we have no evidence; and clarification on this point must await discovery of the burial grounds or of the ossuaries to which previously exposed bodies may finally have been consigned.

## THE DISMAL RIVER ASPECT

The Dismal River Aspect is represented by pottery and other materials from numerous sites widely scattered throughout western Nebraska, western Kansas, eastern Colorado, southeastern Wyoming, and possibly southwestern South Dakota (Gunnerson, 1959). The easternmost known sites are in Harlan and Franklin Counties, Nebr. (Champe, 1949 a). Farther west, roughly between the 100th and 102d meridians, there appear to be clusterings of sites in certain localities—in and around Hooker County, Nebr., on the upper Middle Loup; in Lincoln County, Nebr., around the forks of the Platte; and in southwestern Nebraska in Chase, Dundy, Hayes and Frontier Counties (Gunnerson, 1959). Probably another group could be added in western Kansas, since our observations revealed Dismal River sherds at various points in Scott and Lane Counties, in addition to the village site at 14SC1. Westward from this belt, which may reflect localities of concentrated search more than it does actual distributions, there are scattering occurrences to or beyond the Front Range of the Rockies. A clustering of sites is suggested in the general area of

Denver on the upper South Platte. Sherds typical of the complex have been found at Ash Hollow Cave (Champe, 1946) and in the upper level at Signal Butte (Strong, 1935). All these occurrences lie west of the 99th meridian and most are also west of the 100th meridian, so that the culture may with some justice be characterized as a High Plains manifestation (fig. 105). It should be added that for most of the area of known occurrence west of the 101st meridian, there is little information beyond surface sherd samples, some of them distressingly small.

First recognized in print by Strong (1935, pp. 212, 270), the Dismal River culture was briefly described by him on the basis of limited surface collections from several sites at and near the forks of the Dismal River in the Sandhills of west-central Nebraska. Some of the sherds from the type locality have since been classified as Woodland; but the existence of others clearly assignable to the Dismal River Aspect is established. At the moment, most of our detailed information concerning the complex comes from excavations at several of the Nebraska sites, notably in Chase, Dundy, Frontier, Harlan, and Hooker Counties (Hill and Metcalf, 1942; Champe, 1949 a; Gunnerson, 1959). To this pool of data can now be added the Scott County, Kans., site (14SC1) described in detail elsewhere in this paper.

Dismal River sites occur in a variety of locations—on terraces bordering perennial creeks, around the shores of Sandhill lakes and ponds, in blowouts away from visible surface water supplies, in rock shelters and caves—and perhaps more often than not at a distance from the larger streams of the region. The settlements evidently varied widely in size, their remains today covering areas of an acre or two to as many as 60 or 70 acres. Surface indications, aside from scattered artifacts and other detritus, are usually of the scantiest sort—there are no refuse mounds, fortification lines or ditches, house pits, or other remains of structural features, nor have any associated burials been reported.

Excavations in Nebraska have disclosed posthole groupings that are considered to be house remains at two sites, 25CH1 and 25HN37. Hearths and presumed floor areas have been noted at a third, 25HO21, near Mullen, but here there are no satisfactory posthole patterns in association. The more common grouping is a pentagonal arrangement, first noted at 25CH1 and subsequently confirmed at 25HN37. In this, the house unit centers around five postholes lying at a radius of 5 to 7½ feet from a central unlined hearth. Into these holes, presumably, the main posts were set vertically to be connected at the top by stringers; poles were leaned against these and were in turn covered with a grass or brush thatch. In four of the units at 25HN37, an additional pair of postholes east of the pentagon suggests an entryway; and one unit had 6 center posts. At 25CH1, in addition to the pentagonal unit, there was a 20-foot circle of postholes within which other postholes were scattered about the hearth, the whole suggesting a somewhat different style of dwelling. The houses, as reconstructed from these findings, were probably more or less circular in floor plan, with a diameter varying from 15 to 25 feet. In none of the known structures was there any evidence from which an earthen or sod cover might be inferred; there were no inside cache pits; and all appear to have been erected on or just below the ground surface. The practice of stabilizing posts by wedging them at the base with the joint end of a large mammal bone has been noted at several of the Dismal River sites, including 14SC1 and 25CH1. From the excavations to date it is impossible to say how many house units may have stood at one time or another on the sites we now know or to judge how compactly they were arranged over the site area.

Other features of the village sites include irregular basins of varying size and depth, usually containing a dark fill mixed with refuse, and scattered in apparently random fashion over the area. These were particularly plentiful at 25CH1, occurred also at 14SC1 and 25HO21, but were rare at 25HN37. They range in diameter from 1 to 15 feet, most being between 4 and 7 feet, and in depth from 12 to 51 inches. Their original purpose is unknown. Bell-shaped or cylindrical cache pits, which occur in such numbers in protohistoric sites farther east, are exceedingly rare at Dismal River sites.

At three locations, 25HN37, 25DN1, and 14SC1, have been found pits of another sort. From 25 to 36 inches deep, and up to 60 inches in diameter, these are characterized by a more or less constricted mouth 20 to 48 inches in diameter, heavily burned walls and floor, and a fill usually containing quantities of ash, burnt twigs and sticks, blackened earth, and often stones, which may be fire-cracked and blackened. The fill may contain occasional artifacts and bone refuse, but their primary purpose was not storage or the deposition of trash. There is every indication that these pits were subjected to intense and prolonged heat. The most logical interpretation seems to be that they were utilized in the roasting or baking of some vegetal or meat food, heated stones probably being used also in the process; and thus they have come to be identified as "roasting pits." Perhaps "baking pits" would be a more accurate designation. They have not been found in other protohistoric complexes of the Central Plains, but somewhat similar features, though without known pottery associations, were noted by Smithsonian River Basin Surveys personnel in 1948 at Angostura Reservoir in Fall River County, S. Dak. (Wedel, 1953, p. 22 and pl. 8, *b*); and they have also been reported in post-Spanish levels at Pecos (Kidder, 1958, p. 119 and fig. 33, *b*).

Turning now to the Dismal River artifact complex, we may consider first the pottery. This is gratifyingly uniform over most of the area, although by no means without variations; and it is usually readily distinguishable from other wares of the region. Generally speaking, it is a fairly thin, hard, dark gray to black ware, tempered generously with very fine to medium sand, and exhibiting almost everywhere a pronounced tendency to fracture into small sherds. There is no evidence of coiling, and the pottery was presumably shaped by lump modeling and by the paddle and anvil method. The few whole or restorable vessels so far recovered, most from 25CH1, are small to medium in size, not exceeding 25 cm. in maximum body diameter and 27 cm. in height (but see p. 442). Shapes are simple, the commonest having a more or less globular to slightly elongate (vertically) body with rounded or subconoidal base, constricted neck, and vertical to slightly outflaring rim. Vessel lips are usually simple and unmodified, but may be flattened or slightly thickened horizontally, especially where they have been decorated. There is no certain evidence of bowls, bottles, and other shapes; and handles, lugs, and other appendages are everywhere rare or absent. Much of the pottery is plain surfaced; surface roughening with a grooved or thong-wrapped paddle (i. e., simple stamping) is often present; and very rarely, incising is found. Otherwise, decoration is limited to small diagonal incisions, punctates, chevrons, and other small units on the lip.

Simple and uniform though the pottery tradition generally is, there are local variations that are of interest. The relative proportion of simple stamped to plain sherds, for example, seems to show a significant change from south to north and east in the better-known sites. Thus, at 14SC1, 95 percent of the sherds are plain and less than 1 percent bear simple stamping; at 25CH1, the respective percentages are 69 and 30. Farther east, at 25HN37, the percentage of plainware drops to 60 and simple stamping rises to 40; and still farther north, in the Sandhills, at 25HO21, plain and simple stamping occur in about equal proportions (Gunnerson, 1959). A similar change can be detected with respect to decoration of vessel lips. At 14SC1, for example, much less than 1 percent of lip sherds bear ornamentation; at 25CH1 and 25HN37, decorated lips rise to approximately 15 and 7 percent; and at 25HO21, decorated lips are described by Gunnerson (1959) as yet more plentiful and varied.

Simple stamping is a northern pottery trait in the Plains area. It characterizes most protohistoric and historic Pawnee wares in Nebraska and has an extensive distribution northward up the Missouri into the Arikara and Mandan territories. South of the Pawnee, it is much less common on Great Bend pottery from Central Kansas, where plainwares predominate; and here also the decorative treatment of vessel lips with punctate or incised elements is much less common than to the north. It may be suggested, then, that in these two particulars—simple stamping and lip decoration—the Dismal River pottery complex of western Nebraska and Kansas exhibits northerly or northeasterly relationships rather than southerly.

Another variable in Dismal River pottery is the proportion of mica-tempered or micaceous sherds. These pose an interesting problem. At 14SC1, approximately 5 percent of the sherds are mica-tempered (Scott Micaceous); at 25CH1, a similar ware (Lovitt Mica Tempered) includes less than 1 percent of the sherds; and at 25HN37 and 25HO21, micaceous pieces were extremely scarce. With respect to the better-known Dismal River sites, therefore, micaceous sherds form a diminishing proportion of the pottery from south to north and east. Smith (1949 a, p. 295) points out that Tichy has classified some of Williston and Martin's potsherds from Scott County Pueblo as "late Rio Grande micaceous culinary ware"; and he suggests that the mica-tempered pottery of New Mexico may represent diffusion from the Plains into the Southwest. More recently, Stubbs has kindly examined a series of the sherds I collected at the same site and have described elsewhere in the present paper as Scott Micaceous. Under date of November 26, 1956, Stubbs reports in part that "I would not hesitate to place the sherds from the Scott County pueblo ruin in the same classification as 'Taos-Picuris'. . . . There is still a lot we do not know about this ware, but the paste and temper is quite distinctive both in prehistoric and modern times. I would date your sherds in very late prehistoric or early historic times."

These parallel identifications by Southwesternists and the already noted diminishing frequency of micaceous ware in Dismal River sites from south to north, that is, with increasing distance from the pueblo region, cast serious doubt on Smith's suggestion. Instead of being an Eastern or Plains type, the micaceous pottery seems almost certainly to have been directly stimulated, if not actually imported, from the Southwest. Some of it may have been manufactured on the Plains by fugitives from Taos and Picuris. In line with this probability, Withers has indicated to me his suspicion that much of the micaceous pottery identified in the western Plains as Dismal River may in reality be Taos-Picuris ware. Since Taos micaceous ware apparently goes back as far as the 13th century in the upper Rio Grande, it seems likely that some of the western Plains occurrences of small numbers of "Dismal River" sherds on sites yielding larger quantities of cord-roughened pieces may actually reflect not a Dismal River occupancy but instead prehistoric contacts between the upper Rio Grande and the pre-Dismal River Upper Republican groups.

Clearly exotic sherds have been recovered in at least one Dismal River site under conditions indicating association with the local complex, and they have been reported from others. They include various late polychrome glaze and utility wares from the upper Rio Grande Pueblos (p. 465); and also a few shell-tempered fragments that probably originated at Great Bend Aspect sites in south-central Kansas. So far as I am aware, no Lower Loup or Oneota sherds have yet been identified in the Dismal River site samples.

The tobacco pipes found to date at Dismal River sites include, as we have seen, a preponderance of straight tubular forms made of pottery. At 14SC1 and 25CH1, there are also specimens showing some elaboration of form, as in the flattening and widening of the bit, occasional squaring of the bowl, and, especially at 14SC1, in the modeling of collars and lateral winglike or serrate appendages. These traits are alien to the Plains, as is the presence of fine-line incising that sometimes alternates with blocks of punctate or pricked design. There are also indications of tubular stone pipes or "cloud-blowers," as well as of bent tubular or elbow pipes of stone; but the latter are present in fragmentary condition only.

Work in chipped stone is usually fairly plentiful to abundant. A variety of raw materials was utilized, chief among them being cherts and jasper, the latter often a yellow-brown stone occurring in thin ledges in the Upper Republican drainage and traded or carried widely in Indian days. Chalcedony, quartz, quartzite, and obsidian were less frequently used. Implements included large numbers of planoconvex end scrapers, these predominating at some sites over all other chipped flint objects and sometimes including specimens with small graverlike points. Side scrapers, also planoconvex and with one or two working edges, are likewise common, as are bifacially chipped knives of lanceolate, oblong, quadrilateral, and indeterminate form, sometimes with two or more edges oppositely beveled. Projectile points are small and triangular, with unnotched forms usually predominant, and sometimes decidedly so. There are drills of several types, including some with expanded base and light point, others that are heavier and straight or cigar shaped, and still others with a lateral tang or tangs. At some sites, there are large coarse chopping or hide-scraping tools, sometimes reminiscent in general form of the quartzite scrapers used by the 19th-century Pawnee and other historic tribes (Wedel, 1936, p. 76). Much of the chipped stonework, including especially the smaller objects like projectile points, knives, scrapers, and drills, is less carefully worked than are the same categories at other protohistoric Central Plains sites as, for example, in the Great Bend Aspect of central Kansas.

Objects of ground and pecked stone occur in lesser numbers and variety than the chipped. Like those of chipped stone, they seldom exhibit much skill or care. They include irregular but shaped milling slabs of sandstone or limestone, with flat grinding surface (metates); smaller grinders or anvil stones, with shallow circular depressions in their upper surfaces; one- and two-hand manos; occasional grooved mauls, these usually rudely shaped and never showing the excellent workmanship found on those of the Great Bend Aspect; numerous fragments of elongate boat-shaped sandstone shaft smoothers, used in pairs; sharpening blocks or hones, also of sandstone; occasional limestone blocks with polished grooves, suggesting the shaft polishers of the Southwest; simple tubular and elbow pipes; pecking stones and hammer stones of quartzite or other tough stone. Bits of worked turquoise at one or two Nebraska sites should be noted, as also the presence of graphite. Other stone materials include marcasite and other concretionary forms; fossil shells that were evidently carried into the villages; and, of course, various pigment materials, such as ocher and hematite.

There is also a considerable amount and range of work in bone and antler; and much of this is competently made as well as serviceable. Bison scapula hoes were evidently present in some number at such sites as 14SC1, 25CH1, and 25HO21, though fragments far outnumber complete specimens and the exact nature of the implements in the complex is uncertain. Their presence at these sites, where charred corn was also found, permits the inference that some horticulture was practiced by the natives. Awls are of several well-defined kinds, including broad flat specimens made by splitting mammal ribs; sturdy forms round to triangular in cross section and fashioned from the edges of neural spines or ribs; variously split and ground deer leg bone awls; and finally, splinters that have been sharpened at one end. Punches, polishing tools, or short stubby awls triangular in cross section also occur. Fleshing tools were made from the metapodial and associated ankle bones of the bison, and these have both smooth and serrate blades. There are a few socketed conical and stemmed projectile points, the latter with round or quadrilateral cross section; and wedge-shaped cancellous bone paint applicators are present. A fragment of transversely scored rib implement of the sort sometimes designated as a musical rasp was collected by Williston and Martin at Scott County pueblo; and other distinctive types of rib artifacts whose purpose remains unclear came from the nearby midden and from Site 25HO21. Also in the inventory are rib shaft wrenches, tubular bone beads, eyed needles, bird bone whistles, epiphyseal hide dressers, antler tips with notch or other device for seating or securing a scraper (?) blade, bison ulna picks, and occasional thinly scraped narrow slips of bone or antler whose use is not known. The three-hole flageolet from Scott County pueblo has not been duplicated, so far as I am aware, at other Dismal River sites; nor has the fragment of polished finely incised bone tube from 25CH1.

Worked objects of shell are extremely uncommon. They consist principally of drilled and shaped oblong bits of fresh-water shell that probably represent pendants.

Objects and materials of non-Indian origin are not plentiful at any of the sites, but their consistent occurrence, even if sparingly, is noteworthy. Iron, brass, and/or glass beads have been found subsurface in association with the native materials in at least six sites, including the following: 14SC1, 25CH1, 25DN1, 25FT9, 25HN37, and 25HO21. The iron is sometimes so badly oxidized or so scrappy that its original form is unrecognizable; but it also includes axblades from at least two sites (14SC1 and 25HN37), and awls from two or more. Brass or copper includes conical and tubular objects and small scraps. These items, besides indicating direct or indirect contact with Whites, testify to the general lateness of the Dismal River complex in the Central Plains, and thereby add support to the dendrochronological determinations already mentioned elsewhere in this paper.

The aboriginal features enumerated above for Dismal River are essentially Plains in character. Notable exceptions include the inferred house type with pentagonal foundation; the roasting or baking pits; and, in large part, the ceramic complex, which certainly shows Plains influence in the simple stamping and lip decoration. Among the artifacts listed, incised tubular clay pipes, chipped drills with lateral protuberances, end scrapers with graver points, certain unidentified objects of mammal rib, and perhaps the antler tip hafts, seem at the moment to be more or less peculiar to Dismal River. Otherwise, the items in bone, and in chipped and ground stone, generally occur also in such contemporary, and perhaps somewhat earlier, Central Plains complexes as Great Bend and Lower Loup. The great majority of the artifacts from 14SC1, for example, could easily be lost in our collections from Great Bend Aspect sites. The Dismal River artifact inventory is shorter than that for Great Bend, that is, it lacks some of the types found in central and southern Kansas, and the workmanship on Great Bend artifacts is, on the whole, of superior quality. The Dismal River complex differs further from Great Bend and Lower Loup in the relative proportion of certain artifact categories it has. It shows, for example, a greater proportion of tools and implements suited to, and presumably intended for, the hunt and the products of hunting; and in contrast, fewer items indicative of horticultural pursuits and the storage of crop surpluses.

Many of the items Dismal River shares with Great Bend and other neighboring complexes also occur in late stages of the Pueblo sequence in the upper Rio Grande region. At Pecos, for example, the occurrence of chipped end scrapers, side scrapers, beveled knives, serrate-bladed metapodial fleshing tools, rib wrenches, cancellous bone paint applicators, and epiphyseal hide dressers is viewed as evidence of contacts with Plains Indians (Kidder, 1932, pp. 44, 235, 238, 241); and these types at Pecos occurred either exclusively, or in greatest frequency, in the later Glaze levels, which would be roughly concurrent with the Great Bend, Lower Loup, and Dismal River complexes in the Central Plains. The frequent occurrence at Pecos of flat split-rib and "rib-edge" awls is again reminiscent of Dismal River; and the chipped drills include both straight and expanded base types, as well as at least one specimen with double lateral tangs which has a counterpart at 25CH1 (cf. Kidder, 1932, fig. 12a, and Hill and Metcalf, 1942, pl. 7, fig. 1D). Stemmed bone projectile points also occur sparingly at both Pecos and the Dismal River sites. That these Dismal River-Pueblo relationships were two-way is indicated, of course, by the often recurrent presence at Dismal River sites of such Southwestern features as incised and punctated tubular pottery pipes, turquoise, obsidian, bone flageolets, Rio Grande Pueblo trade sherds, occasional fine-grained arrowshaft polishers, finely incised bone tubes, and perhaps other items.

Still farther afield, the Dismal River complex shows some interesting similarities to archeological materials from the Promontory Point caves in north-central Utah. Some 20 years ago, Steward (1937, p. 44) noted the distinctiveness of the Promontory pottery from all known Great Basin wares and suggested the possibility that it "was derived from some northern Plains people." Other similarities have been noted by Hill and Metcalf (1942) and more recently by J. H. Gunnerson (1956), these including such items as end scrapers (including the tanged or graver-point variant), tubular steatite or schist pipes, bone punches, sandstone arrowshaft smoothers, bison metapodial fleshers, etc. Both Steward and Gunnerson emphasize the fact that the Promontory peoples were apparently primarily bison hunters rather than seed gatherers, like the Shoshoneans of the Utah region; and Gunnerson (1956, p. 72) suggests that the Promontory material may represent "an early protohistoric thrust by a buffalo-hunting Athabascan group into the Great Basin from the Plains."

From the archeological evidence now available, some inferences regarding the Dismal River way of life are possible. It seems fairly certain, for one thing, that these people were primarily hunters and only secondarily tillers of the soil. The artifact inventory shows a high proportion of stone and bone tools that were probably or certainly associated with hunting, butchering, and skin-working practices. Among these may be included the abundant chipped-stone scrapers, knives, choppers, projectile points, and perhaps drills, as well as the bone awls, fleshing tools, epiphyseal hide scrapers, rib shaft wrenches, paint applicators, and needles. Tools and devices from which horticulture may be inferred are, on the other hand, comparatively limited in both number and variety—bone hoes, metates, and manos. Absence or great rarity of cache pits at most worked sites suggests either limited crop surpluses or else storage techniques different from those of other Plains semihorticultural complexes. The use of roots, berries, and other edible plant products is indicated; but of fishing there is no evidence, either by hooks or other devices among the artifacts or by the refuse bone. The sites themselves suggest some permanence in the presence of fixed dwellings and in the quantities of refuse; but it is not clear whether year round occupancy was customary. The sites at which sustained excavation has been carried on may have been winter stations of a normally more nomadic people, with sizable aggregates collecting seasonally over a long period of years at such spots as 14SC1 and 25CH1. On the other hand, the location of the principal known sites along a north-south axis near the eastern margin of the High Plains, where maize-growing was less precarious than a hundred or two hundred miles to the west, may imply that these were especially favored locations where some horticulture was practiced year after year while other segments of the populace ranged widely during the spring, summer, and fall months in pursuit of the herds. The quantities of small game represented at some sites, as at 25CH1, suggest that there may have been periods, in winter or at other seasons, when the bison were not readily available and foraging was necessary.

Regarding the appearance of the people themselves we know nothing from the archeological work; nor can we reconstruct in detail the nonmaterial aspects of their community life. The scarcity of ornaments and art objects and the apparent emphasis on useful rather than beautiful implements may suggest preoccupation with getting a livelihood in an often trying environment. There is no evidence that the horse was known, but the dog was present and may have been used sometimes for food. Contacts with other groups is indicated by items or practices identifiable with the Great Bend Aspect (Wichita) peoples of central Kansas and the Lower Loup Focus (Pawnee) of east-central Nebraska, and by others clearly originating in the Pueblo region.

As has been indicated, the Dismal River sites we know most fully have all been dated, either through tree rings or by cross finds of Southwestern materials, at approximately A. D. 1700, plus or minus 25 years or so. Earlier stages of the culture, preceding 1650, remain undiscovered or unidentified. These late 17th- and early 18thcentury archeological materials occur in the region where, according to historical documents, the Spanish from the Rio Grande settlements came into repeated contact with the Plains Apache around 1700; and the evidence that the Dismal River culture represents the material remains of the Plains Apache seems convincing (Champe, 1949 a; Secoy, 1951; and supra, p. 466). This identification permits use of the Spanish documents in filling in some of the gaps in our picture of the Dismal River culture as derived from archeology. As I see it, the archeological data at hand conflict in no significant way with what the documents (see especially Thomas, 1935) tell us of the way of life of the Plains Apache during the period in question.

The material culture of the Dismal River people has been characterized by one student as impoverished, their way of life by another as dismal. Comparison of the artifacts recovered at 14SC1 and 25CH1 with those from Lower Loup (Pawnee) and Great Bend (Wichita) village sites of comparable age in central Nebraska and Kansas indicates that the Dismal River people had much of the basic horticultural and hunting equipment possessed by their more sedentary corn-growing neighbors. It is perhaps true that they had fewer of these items—that in proportion to the amount of digging done there are significant quantitative differences as between the Dismal River people and their neighbors. The Dismal River groups dwelt mainly in a region of notoriously low rainfall and consequent horticultural uncertainty; and the absence of cache pits from their sites may imply a more perfunctory maize gardening and perhaps scantier crop returns than were enjoyed by their more favorably situated easterly neighbors. Horticulture, in short, was a less rewarding and therefore a less reliable subsistence basis than was hunting. Like any people relying heavily or primarily on the chase, they doubtless alternated between plenty and scarcity; and if, in a season of scarcity, their crops failed for want of rain the winter condition of the people may well have been a precarious one. The comments by some of the Spaniards who had been among the Cuartelejo Apache before 1720 are directly relevant (Thomas, 1935, pp. 157, 161, 173).

All this suggests that the Dismal River people perhaps stood in about the same relationship to their Pawnee and Wichita neighbors as did the short-grass rancher or the marginal farmer of 50 years ago to the Corn Belt farmer of eastern Nebraska and Kansas. The Dismal River way of life was certainly an austere one, but it appears to have been well adjusted to the limitations and opportunities of the environment. By comparison with the struggle for survival waged by the foragers of the Great Basin, I doubt that the life of the Plains Apache was dismal or that their material culture can be considered chronically impoverished.

## THE ONEOTA ASPECT

The Oneota Aspect, unlike the Dismal River and Great Bend Aspects, is not in the main a Plains manifestation. The great majority of known sites lie east of a line drawn along the Big Sioux River, thence down the Missouri River to Kansas City, and southward along the Kansas-Missouri boundary. Above the Kansas River, probably less than half a dozen Oneota sites have been recorded west of the Missouri. Of the four actually reported in print, summarily or otherwise, three (Fanning, Leary, Ashland) are within 25 miles of the mainstem; the fourth (Stanton) is not more than 50 miles distant.[49] The nature and extent of Oneota sites in southeastern South Dakota, where the Big Sioux, Vermillion, and James River valleys might be expected to fall within the general area of distribution, remains obscure. In Missouri (Chapman, 1946, 1952), most of the reported sites are situated along the right bank of the mainstem in the western half of the State; but if the somewhat deviant sites identified as Osage be admitted to the Oneota category, Vernon County at the west edge of the State would be included. In eastern Kansas south of Kansas River, no true Oneota sites have yet been reported.

Oneota sites, as contrasted to sites showing possible or probable Oneota influence, thus have a scattering distribution along the eastern margin of the Central Plains. These westerly sites exhibit certain interesting variations from those farther east. They represent a clearly defined and distinctive Upper Mississippi manifestation, the nature and extent of whose influence in the development of late prehistoric and protohistoric culture complexes in the Central Plains of Kansas and Nebraska, and on the Middle Missouri in the Dakotas, still await clarification.

East of the Missouri River, Oneota sites have a wide distribution in Iowa, southern Minnesota, Wisconsin, and Illinois. In Iowa (Mott, 1938), there is a notable concentration of village and burial sites on the Upper Iowa River in Allamakee and Winneshiek Counties; along the Little Sioux in Clay and Dickinson Counties, and again in Cherokee and Woodbury Counties; on the Big Sioux in Lyon County; on the Des Moines in Polk and Warren Counties; and on the Mississippi in Muscatine, Louisa, and Des Moines Counties. The Minnesota sites (Wilford, 1955) are mainly south of Minnesota River, centering in the Blue Earth and Root River drainages, with at least one noteworthy site near Red Wing on the Mississippi. In Wisconsin (McKern, 1945), there are at least three and perhaps four main areas of occurrence: one along the Mississippi in Pepin, Trempeleau, La Crosse, and Vernon Counties; another on Lake Winnebago, the nearby Fox and Wolf Rivers, and at the southern tip of Green Bay; perhaps a third on Grand River in Green Lake County; and a fourth—still undescribed—around Lake Koshkonong and the upper Rock River in the southern part of the State. In Illinois, the Blue Island or Huber site in Cook County is safely classed as Oneota; and Oneota influences have been noted at the Fisher site in Will County, at the Crable site in Fulton County, in Jo Daviess County, and at Pere Marquette State Park in Jersey County.

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[49] See fig. 105. The Fanning site is reported in this paper. The Stanton site is under analysis by Dolores Gunnerson. For Leary, see Hill and Wedel, 1936; for Ashland, Hill and Cooper, 1938, p. 267.

Despite its widespread occurrence and demonstrable importance to Upper Mississippi Valley prehistory, current information on the Oneota Aspect is distressingly uneven and incomplete. Some preliminary reports, partial analyses, and summary statements are available, and there is no lack of speculations as to its origin, age, identity, and role in midwestern prehistory. Unfortunately, however, for the several variants known to exist among the large and important sites east of the Missouri, there is not a single comprehensive published report detailing the results of extended systematic excavations at a defined community, that is, at a site where both living area and burial grounds are represented. The nature, size, and number of dwelling units has nowhere been established; expert identification of the animal and vegetal refuse recovered at habitation areas, by which ecologic adjustments from one locality to another might be assessed, have not been made or remain unpublished; and in several instances, the extant materials are largely surface finds or burial accompaniments, and thus inadequately illustrate the material culture complex by which the people carried on their daily routine of living. All this makes more difficult the task of outlining the material culture complex of the Oneota and its variants.

The Oneota Aspect is represented by both village sites and burial grounds. Areas of habitation usually vary from an acre or less up to 40 acres or more; at the Utz site in Missouri and the Leary site in Nebraska, occupational refuse covers areas of more than 100 acres; and the Hartley-Lane site on the Upper Iowa may be as large or larger. East of the Missouri, no direct evidence as to house type has been found and structures of perishable materials are inferred. In Nebraska and Kansas, there was some use, at least, of substantial earth lodges. Refuse-filled pits, probably used originally for storage, are characteristic; in the eastern sites these were commonly bowl shaped, whereas in the west the deep cylindrical or bell-shaped forms were characteristic. Fortifications in the form of stockade ruins, walls, or ditches are nowhere indicated. Earthen enclosures have been noted at Oneota sites on the Upper Iowa, at the Blood Run site in Lyon County, and at Toolesboro in Louisa County; but their assignment to the Oneota culture is open to question. Other than low middens, there are no mounds certainly attributable to the Oneota, unless those in Minnesota from which Oneota burials were taken are correctly identified with the Orr Focus (Wilford, 1955). In Iowa burials were often made intrusively into mounds of earlier origin. Interment was usually singly, extended, and in the flesh, commonly with pottery or other associated artifacts. At the larger sites, considerable quantities of bone, shell, broken pottery, worked stone, and other village detritus indicate prolonged and fairly intensive settlement. This was clearly based in part on maize horticulture, in part on hunting, fishing, and gathering.

Artifact materials include considerable quantities of pottery, almost exclusively shell tempered and with smooth surfaces. The basic form was a globular jar, with rounded base, somewhat constricted neck, and vertical or flaring rim. Two to four oppositely placed strap or loop handles commonly connected the rim and upperbody. On the upperbody and rounded shoulder, groups of parallel trailed or incised lines, in various patterns and often associated with punctate elements, formed a decorative zone. Round or elongate punctates were used in various ways—as fringes to trailed lines, in blocks between lined areas, or under handles. Vessel lips commonly carried small punctate units, notching, finger impressions, or scalloping on their surfaces.

Other artifacts included an abundance of small unnotched triangular chert projectile points, end scrapers, well chipped elliptical or diamond-shaped knives, a large variety of irregularly shaped knives and scrapers, a few drills, and bipointed objects that may be fish gorges. Ground stone includes longitudinally grooved sandstone arrowshaft smoothers, celts, occasional axes, mortars, round or oval mullers, discoidal hammerstones, disk and other forms of pipes, and, in some localities, inscribed catlinite tablets. In bone work, there are many awls of various types, but mostly of split or unsplit mammal leg bone; tubes, either plain or incised; a few large mat-sewing needles; and scapula hoes. Antler objects include socketed conical projectile points, flakers, and perhaps other items. There is some work in shell, chiefly beads and spoons; and also, especially in the northeastern sites, some native copper tubes and sheet ornaments. White contact materials are found in some, but not all, Oneota sites.

The Oneota Aspect, superficially considered, shows remarkable uniformity throughout most of the area of its occurrence; but its manifestations are by no means identical in their cultural content. Analysis of the data extant, uneven though they are, reveals the existence of a number of variants. These are based chiefly on consistent localized differences in pottery, and to some extent in other categories of material culture. Some of the differences undoubtedly represent unequal or inadequate sampling; others may reflect chronological, geographical, or environmentally conditioned variations. Still others, however, by their regular recurrence and limited association with other items, probably indicate valid group distinctions. In any event, since the observed variations east of the Missouri are apparently matched by significant variations to the west, some notice should be taken of the focus differences now believed to exist.

Of first interest is the Orr Focus, which comprises a highly consistent series of materials in northeastern and extreme northwestern Iowa, southeastern Minnesota, and across the Mississippi in adjacent Wisconsin. Surface remains from Clay and Dickinson Counties, Iowa, in the upper Little Sioux drainage, should probably be included. The materials from the Upper Iowa River sites show substantial identity except in respect to White trade goods—their absence or presence, and their amount when present. To the complex here represented, Keyes (1927) originally assigned the name "Oneota culture," after the term by which the Winnebago are said to know the Upper Iowa River. Especial importance attaches to the concentration of village sites and burial grounds of this locality because it can be safely ascribed on documentary and archeological grounds to the Iowa Indians of the early 18th century (Keyes, 1927, p. 224; Griffin, 1937 a; Mott, 1938).

Most of the available information is derived from seven village and burial sites in Allamakee County, Iowa, and from limited excavations at a few sites in nearby Wisconsin and Minnesota. The village sites are usually situated on streamside terraces and range in area from a few acres up to 60 or more. Refuse-filled pits, usually bowl shaped, are fairly common; and there are considerable accumulations of cultural detritus over the area of former residence. Burial grounds may lie in close association with the village area, or at a little distance on elevated spots and hills. The single extended burials were sometimes covered with stones, with mounds reported only for Minnesota. Semiseated burials, with head and shoulders raised slightly, occur in Wisconsin and occasionally on the Upper Iowa. Pottery and other cultural objects are often associated with the burials.

Orr Focus pottery (Keyes, 1927; Mott, 1938; Griffin, 1943, p. 287; McKern, 1945, p. 145) consists chiefly of globular jars of the basic form described above among the aspect traits, but a squatty elliptical variant is highly characteristic. Quite common are handles, usually of the broad strap variety. Many of these widen strongly toward their upper end; and "tails" or "crests," like those on handles from Leary, or a prominent medial ridge, such as occurs at Fanning, are found on Upper Iowa sites. Rims are straight, vertical or slightly flaring, and the lip surface typically bears impressed or punctate decorative elements. Body decoration consists primarily of groups of parallel vertical or slanting trailed lines, combined with some use of punctates; on the Upper Iowa, and to lesser extent in Wisconsin, punctates are frequently massed in triangular areas on the body or in the spaces below vessel handles. Broken lines or rows of short dashes are present in some number. The chevron motif is found in Iowa and Minnesota sites, but less commonly than in Wisconsin. As a rule, the trailed lines are much narrower than are the spaces between lines; and decoration occurs on about 20 to 25 percent of all body sherds. A few sherds typical of the Lake Winnebago Focus have been found at Orr Focus sites on the Upper Iowa.

Among nonpottery traits, stonework includes the following in addition to the aspect traits: round "thumbnail" scrapers, retouched on all edges; snubnose or end scrapers which, like the triangular projectile points, tend to be shorter and wider than those from western Oneota sites; relative abundance of catlinite, notably for disk, equal-arm, and other forms of pipe; small bone "counters," and use of birchbark. Inscribed catlinite tablets have been found on Upper Iowa sites and at Blood Run, in Lyon County, but in no other Orr Focus components. Objects thought to be of native copper, nowhere plentiful, include rolled tubes (beads?) and small sheet metal ornaments.

White contact materials are associated with Orr Focus sites on the Upper Iowa and in Lyon County, Iowa, as well as in Minnesota. On the Upper Iowa, they are noticeably less abundant on upstream sites than on those near the mouth. They include only small simple items such as helical coils of brass wire, iron fragments, and glass beads. No axes, hoes, traps, or gun parts have been identified in this trade material.

The Blue Earth Focus (Wilford, 1955) includes remains in southern Minnesota and in western and south-central Iowa. It apparently centers along Blue Earth River and the adjacent southerly bend of the Minnesota, with the Humphrey site in Faribault County, Minn., as the type location. Other probable occurrences include materials along the Little Sioux River in Iowa which Keyes once termed the Correctionville Focus, and several undescribed sites in Polk and Warren Counties, central Iowa. There has been very little excavation in sites of this complex, and the Iowa sites are known only from surface collections.

Pottery of the Blue Earth Focus, represented mainly by sherds, is typically Oneota, but differs in certain particulars from that in Orr Focus. There is, for example, no evidence of the elliptical jar so characteristic of the latter. Rims are proportionately shorter; at the

Humphrey site and in Woodbury County, Iowa, punctate, impressed, and occasionally trailed decoration occurs as frequently on the inner rim as on the lip. Vessel ornamentation impresses one as perhaps somewhat more ornate than in Orr Focus, but with less variety of motifs; and it consists largely of trailed lines and punctates. Highly characteristic are groups of parallel vertical lines separated by horizontal chevrons bordered by single rows of punctates; or the punctate-bordered chevrons cap the blocks of vertical lines. Similar motifs are known from Orr Focus, but are much less common. In Blue Earth, the punctates functioned more often as a fringe to the trailed line areas whereas in Orr they commonly constitute area fillers. There are a good many vessel handles, usually attached at their upper end to the lip rather than to the rim exterior; and they usually carry more decoration than those in Orr Focus.

With respect to nonpottery traits, projectile points and end scrapers tend to be narrower in proportion to length than in Orr. Catlinite is scarce. Other items include occasional bone "counters," scapula hoes, antler picks, and numerous bell-shaped cache pits. There are no White contact materials from Blue Earth sites.

The Lake Winnebago Focus (McKern, 1945) centers about Lake Winnebago in eastern Wisconsin. It is best known from the McCauley and Karow sites, on the west shore of the lake in Winnebago County. Both are village sites and represent some intensity and duration of aboriginal occupation, with many refuse-filled pits and considerable accumulations of trash. The Karow site includes a burial ground. Karow is described as essentially a "pure" Oneota complex, McCauley as predominantly so. Both, it is worth noting, lie well within the territory occupied in early historic times by the villages of the Winnebago.

Lake Winnebago pottery (Griffin, 1943, p. 296; McKern, 1945) is in many respects the finest of all Oneota wares. The fabric is more compact, surfaces less pitted and better smoothed, and the pottery generally more carefully made, than the Orr Focus or Blue Earth materials. The predominant and almost exclusive form is again a globular somewhat squatty jar, which never assumes the elliptical shape of Orr Focus vessels. Handles are rare; when present, they are of the flattened strap variety. Rims are straight; the great majority are strongly flared, with their inner surfaces sometimes assuming an almost horizontal position. Lip surfaces, usually flattened, are decorated in about 25 percent of specimens, with closely spaced round impressions that result in a distinctly notched effect. Shoulder decoration is by trailed lines which are often broad shallow flutes, carefully executed, with narrow intervening spaces. Very distinctive is a row of punctates encircling the bessel at base of the neck; below this row there are sometimes four trailed lines encircling the pot, with vertical lines below these running to the shoulder. Massed areas of punctates occur, as do punctates bordering trailed lines, dashes, and inner rim trailing. There are no chevrons or massed slanting lines in adjoining or opposed blocks.

Lake Winnebago nonpottery traits include a rather limited variety of objects in chipped and ground stone, bone, antler, shell, and native copper. There is less chipped stone than in Orr Focus sites. It includes, not unexpectedly, small triangular unnotched projectile points and end scrapers, the latter less abundant and rather cruder than in Orr Focus. Fragmentary cutting tools are found, but there is no evidence of the elliptical and diamond-shaped blades. Bipointed stone objects (awls, drills, or fish gorges?) are not reported. Chipped disks, circular to subcircular in outline, are common at McCauley; but the small circular "thumbnail" scraper type with all edges retouched is absent. Ground stone includes paired sandstone shaft smoothers, hammerstones, mortars, mullers, spherical biconically drilled pipe bowls, and worked catlinite. The disk pipes, directly associated in situ with Orr Focus in western Wisconsin, occur only as surface finds in the Lake Winnebago district; but their concentration here suggests that assignment to the Lake Winnebago Focus complex is highly likely. Bone artifacts include split bone awls of mammal and bird bone, double-pointed cylindrical and also spatulate perforators, mat-sewing needles, oblong counters, and bird bone tubes, some with incising. There is abundant shellwork, including tanged spoonlike forms, rare fish effigies, notched fragments, disks, and beads. Work in native copper consists chiefly of tubular beads and sheet pendants, to which may be added rare finds of conical projectile points (?), perforators, and unidentified pieces.

Since the McCauley and Karow sites are both reported to have been traditionally habitation sites of the Winnebago, it is of interest to note that a clay trade pipe, glass beads, iron fragments, and gun flints were found at the former. If the association here is not accidental, it suggests that a combined ethnohistorical and archeological attack on the problem of tribal relationships might be extremely fruitful; but I am unable to determine that the leads thus proffered have been developed in any appreciable measure.

The Grand River Focus (McKern, 1945) is represented at present chiefly by the Walker-Hooper site in Green Lake County, Wisc., located some 40 miles southwest of the center of the Lake Winnebago Focus. This site includes "a highly productive village site and mound group," with associated mound and nonmound burials, refuse-filled pits, and a detritus-laden habitational area. A "large majority" of the cultural remains here are identified as characteristically Upper Mississippi; but the assemblage is rather markedly deviant from the three Oneota Foci considered so far. Mound burials, for example, are atypical in Oneota, though said to occur in Minnesota; and the flexed or semiflexed, and prone extended burials at Walker-Hooper have no known counterpart elsewhere in the Oneota. Further, as McKern (1945, p. 162) notes, the "Orr and Lake Winnebago potteries are more similar to each other in many respects, including decoration, than either is to the pottery of the intermediate Grand River focus."

Grand River pottery (Griffin, 1943, p. 293; McKern, 1945) includes as its characteristic shape a globular jar, which averages appreciably smaller in size than Orr and Lake Winnebago vessels, and has an orifice larger in proportion to body size. A beakerlike form is also reported. Most jar rims are vertical or slightly flaring; about 11 percent are recurved, and all tend to be shorter, i. e., lower, than in other Oneota wares. About 60 percent of lip sherds are undecorated; where decoration occurs, it is usually on the lip or on the outer upper rim, the latter again atypical. The rare handles are of the loop variety and without ornamentation. Opposed perforations or slots below the lip, presumably for attachment of a thong or bail, are sometimes present. Body decoration is very rare, being represented on less than 5 percent of the body sherds. It consists of trailed lines, usually narrow and never flutelike; and there is little use of punctates. A relatively common motif consists of two or three parallel zigzag lines encircling the pot at the shoulder; parallel vertical or slanting lines may fill the upperbody between neck and shoulder, or single triangulate or circular units may repeat themselves around the upperbody. Several vessels are reported to have "a succession of large embossed nodes" about the shoulder or upperbody. Presence of a few negative painted sherds, and of others with paddle impressions reminiscent of the simple stamping on historic pottery from the Plains, is noteworthy. Disks cut from potsherds and centrally perforated are also present.

Nonpottery traits include the usual unnotched triangular chipped projectile points; snubnose end scrapers; flake knives, but none of elliptical or diamond shape; drills with expanded base, few or no straight forms; mullers; celts; hammerstones; disk pipes, mainly as surface finds; worked catlinite; sandstone shaft smoothers; plain and incised bone tubes; bone fishhooks; bone beamers; considerable work in shell, including especially tanged spoonlike objects, sometimes with serrations, and fish effigies; and native copper in the form of tubular beads, sheet pendants, awls, etc. Notable absences include bipointed chipped-stone objects, flakers of bone or antler, and scapula hoes.

There is no White contact material in the Walker-Hooper site inventory, nor is there any indication in the published record that Lake Winnebago, Blue Earth, or Orr Focus sherds were found here.

This may indicate a somewhat earlier date for Grand River, but more extended investigation is needed before this point can be cleared up. The feeling persists, too, that Grand River is "off-color" as compared to the Oneota manifestations described briefly above. The usual jar form here is deviant, as is the low rim tending to a recurving or rolled profile, the general scarcity of body and lip ornamentation, the beaker form, loop instead of strap handles, knobbed shoulders, rim perforations or slots, and negative painting. Some of these items are characteristically Middle Mississippi in flavor, as for example negative painting, beakers, and low rolling rim. Many of them are reported from the Spoon River Focus in Illinois. The quartered circle, or cross within a circle, which constitutes one type of body decoration in Grand River, is also Middle Mississippi. In this connection, it is interesting to note that two copper disks in Middle Mississippi style have been reported as surface finds in Green Lake County—one from "a well-known Upper Mississippi site," the other from a Grand River site in Kingston (Pasco and Ritzenthaler, 1949). One of these shows the quartered circle, with small bosses filling each quadrant.

In the absence of a comparative trait list giving not alone presence or absence, but also actual numbers, it is impossible to do more than suggest that Grand River's possible relationships to Middle Mississippi perhaps merit as careful exploration as do its resemblances to the Upper Mississippi Oneota in which its students have placed it.

In northern and western Illinois, Oneota culture or influences have been recognized at several sites. With rare exception, these stand in marked contrast to the comparatively rich and distinctive Orr Focus, Blue Earth, and Lake Winnebago complexes of Iowa, Minnesota, and Wisconsin. The Huber site near Blue Island, where village remains and several extended burials were found, appears to be closest to the "classic" Oneota with respect to pottery, nonpottery, and burial traits (Griffin, 1943, p. 286). Elsewhere, Oneota influence is manifested in varying degrees of admixture with other complexes at the middle levels of the Fisher site (Griffin, J. W., MS.) and at the Crable site (Smith, 1951), as apparently also on Apple River in Jo Daviess County (Bennett, 1945). The general area here involved is one in which extensive tribal realinements took place in the 17th and early 18th centuries, and not improbably for some time previously. It would seem reasonable to expect mixed and/or stratified sites in such a contact area; and the locations at which Oneota influences appear may well be attributable to contacts between the Chiwere peoples from the north and northwest and Algonkian groups with Middle Mississippi or other culture in the Illinois region. A sustained archeological program oriented in light of ethnohistorical findings would seem particularly promising throughout this region. Alternatively, depending on their final placement in time, some of these sites may reflect an early stage in Oneota differentiation out of a Middle Mississippi-related ancestor.

The exact relationships of the trans-Missouri Oneota sites to the several foci briefly characterized in the foregoing pages remain unsettled. This is, in fact, a complicated problem which awaits more detailed analytical work than has yet been brought to bear on it. Like the Iowa and Wisconsin manifestations, however, the western and southern sites from which most of our information derives—Leary, Fanning, Ashland, Stanton, Utz, and other sites in Missouri—clearly reflect a basic subsistence economy divided between maize horticulture and hunting, with some gathering and probably also fishing. They suggest communities of varying and sometimes considerable size, with Utz and Leary doubtless inhabited by several hundred people and comparing favorably in intensity of residence with the largest of the Iowa and Wisconsin sites.

As a group, the western sites appear to diverge from the named foci in a number of particulars. There is not much evidence regarding the prevalent house type, but the earth lodge was pretty certainly known and in use at nearly all western sites. The circular form is indicated at Fanning and Stanton, the older square form at Leary and probably at Ashland. Cache pits are everywhere plentiful, with bell-shaped (undercut walls) and cylindrical (vertical walls) profiles prevailing over the bowllike forms of the Iowa-Wisconsin area.

In its general characteristics of shell tempering, trailed and punctate decoration, and preponderance of globular jars with constricted neck, pottery is substantially like the eastern Oneota and can be readily distinguished from that of other eastern Plains complexes. Occasional elliptical jars at Leary and Utz are reminiscent of Orr Focus on the Upper Iowa; but their presence elsewhere in the west has not been demonstrated. Tapered strap handles occur at all western sites, again as on the Upper Iowa. Flattened vessel lips are rare, and sharply flared rims virtually absent. Except at Ashland and Stanton, the majority of rims at all sites carry decoration, but in varying fashion. Ornamentation of the inner upper rim, for example, predominates in the small sample from Ashland, is found on about half the Stanton rims, is a minority trait at Utz and Leary, and is all but absent at Fanning.

Among other features that appear to distinguish the western Oneota sites may be listed the following: high frequency of bison scapula hoes, bone arrowshaft wrenches, and antler projectile points; a tendency toward somewhat greater size in chipped stone projectile points and end scrapers, with the latter especially present in large numbers; more ground stone traits, including grooved mauls, inscribed catlinite tablets (cf. Iowa Orr Focus), greater frequency of catlinite, and perhaps more numerous grinding stones; much less worked shell; scarcity or absence of bone "counters" and metapodial beaming tools.

Some of the items that distinguish western from eastern Oneota site complexes, such as grooved mauls, arrowshaft wrenches, jug-shaped cache pits, and occasional (?) use of the earth lodge, are common in late prehistoric and protohistoric Plains cultures. Their appearance at the western fringe of the Oneota area doubtless reflects increasingly stronger orientation of Oneota material culture toward the semisedentary Plains Indian way of life as western contacts became closer. A number of widespread Plains traits of this period, on the other hand, do not appear on Oneota sites, or else are sporadically manifested. These include simple stamping on pottery, grit tempering, flat split-rib and "rib-edge" awls, stemmed bone projectile points with square or round cross section, large straight-shafted flint drills, cancellous bone paint applicators, transversely scored ribs, metapodial fleshers or grainers with serrate blade, and adz-shaped elkhorn scraper handles. The last two items are known from Stanton, scored ribs and paint applicators from Missouri sites.

While the general affinities of the western Oneota sites are clear, it would be premature to attempt assignment of any of them to one of the named foci or to group them in another focus. From site to site there are differences, as well as similarities, that suggest Orr Focus relationships in some instances, Blue Earth in others, etc. Leary and Stanton potterywares may be considered highly typical Oneota; they probably show closer and more consistent similarities to the Utz materials than does Fanning pottery; and Leary, Stanton, and Utz are all more suggestive of Blue Earth Focus than of any other named Oneota subgroup. Utz, on the other hand, where the greatest amount of digging has been done and researches are continuing, shows much greater variety in all respects than do other western sites, with some indications of chronological differences and of Middle Mississippi influences. An impression persists that Fanning is somewhat more deviant than the other western Oneota manifestations here considered. Its pottery complex shows a high incidence of plain undecorated rims and body sherds, a near-absence of punctates as fringes on trailed zones or as area fillers, relative abundance of a row of small punctates or identations between parallel trailed lines, numerous tapered strap handles with or without vertical flutings, and abundance of high straight rims. In nonpottery traits, our sample is lamentably small; but it suggests inferior stone-chipping techniques and fewer stylized knives. There is a feeling that the people who lived at Fanning, while clinging to an Oneota tradition, somehow did not care much and made little effort to achieve the standards reached by other related groups of the western periphery.

The Oneota Aspect, as we have noted, includes sites that yield limited quantities of White contact material and others that do not. The complex thus bestrides the shadowy border line between the undocumented prehistoric and the post-White contact periods. This relatively late chronological position permits plausible identification of some of the materials with documented tribal groups. Thus, the Orr Focus sites on the Upper Iowa, where trade goods have been noted at most sites excavated, are in all likelihood the former habitat of the Iowa Indians. In Wisconsin, history and tradition link some of the Lake Winnebago Focus sites with old Winnebago settlements; ethnohistoric data and the presence of scanty contact materials make it virtually certain that this identification is also valid. In Missouri, the highly typical Utz site, along with lesser ones nearby, is surely assignable to the Missouri; and the somewhat deviant assemblage in Vernon County, where Oneota influence is strongly manifested, seems as certainly Osage. Beyond this, the problem is not so simple. For the Blue Earth Focus, including the Correctionville materials, Keyes once suggested an Oto authorship; and because of the similarities he noted between Leary and Blue Earth Focus, he further observed that "Leary should align with Oto." More recently, Wilford has suggested that Blue Earth is possibly an earlier stage in the development of Orr Focus, that is, ancestral Iowa. Unfortunately, Leary seems beyond reach of documentary evidence, and so cannot now be correlated with any recorded movements of the Oto, Iowa, or any other tribe. Fanning has been tentatively identified with the Kansa; but the tribal identity of Stanton remains unsettled. Ashland is admirably situated to be the site of an Oto village of the early 18th century; but absence of White contact material and possible presence of a rectangular house complex suggest an earlier time level.

While the early historic residence and wanderings of the Chiwere Siouans, and perhaps those of the Dhegiha as well, promise acceptable explanations for substantial portions of the Oneota distributions, this is certainly not the whole story. Relevant ethnohistorical data first appear shortly before the middle of the 17th century, but they are of little real help until the 1650–1700 period; and probably at this time and a little later, the Orr and Lake Winnebago Foci complexes were presumably still functioning as the material culture of identified tribes—the Iowa and the Winnebago. What their precise nature may have been a century or two earlier has not been determined, there being no established chronological sequence in the Oneota tradition. Absence of White contact material at Blue Earth sites, if confirmed by more extended investigations, suggests that this focus was flourishing on an earlier 17th-century time level or before. If Leary predates A. D. 1600, as suggested in figure 106, this site and Utz may be regarded as evidence that by the 16th century, or before, a well-developed Oneota complex was already established at several points on the west bank of the Missouri. The presence of Oneota influence even earlier is suggested in the shell-tempered trailed and punctated sherd—reminiscent of Blue Earth—figured by Cooper (1936, pl. 13, fig. 3) in an otherwise alien complex from St. Helena, along with disk pipe fragments. Elsewhere in Nebraska, an Oneota strain has long been recognized in the pre-White contact Lynch complex, where it appears to be associated with late Upper Republican and Nebraska Aspect elements (Freed, MS.); and more recently in the Redbird Focus, a later complex with protohistoric affiliations to north and south (Wood, MS.).

In Kansas, aside from the Oneota complex at Fanning, notice must be taken of materials in other localities which have at one time or another been termed Oneota. These include materials from the Blue River valley (Cumming, 1958), from White Rock Creek in Jewell County, and from Glen Elder in Mitchell County. Among the limited materials I have seen from these localities, there are small thin sherds with trailing and fine line incising on shoulder areas, usually in patterns of parallel slanting lines and sometimes including, as at 14PO12 and 14PO13 in Tuttle Creek reservoir area, the use of small punctates, indentations on the lip, and finely crushed shell tempering. At White Rock Creek and Glen Elder (Wedel, 1935, p. 227; Cooper, 1955, p. 13; Rusco, MS.), the specific ceramic resemblances to Oneota are much less close and there are notable differences: the almost exclusive use of grit instead of shell for tempering, and the moderate abundance of simple stamping. Locally, the ware is readily distinguishable from that on neighboring Upper Republican and other sites, earlier and later; but it is a far cry from the pottery at Leary and Fanning. Nonpottery remains are inadequately represented; but such characteristic Iowa Oneota items as stone disk pipes have been reported from White Rock Creek (pl. 84, *d*). Grooved mauls, four-edged beveled knives, triangular unnotched projectile points, catlinite, "rib-edge" awls, and other items indicate a fairly late prehistoric or protohistoric time level; but no trade materials have been reported from either site. An Upper Mississippi

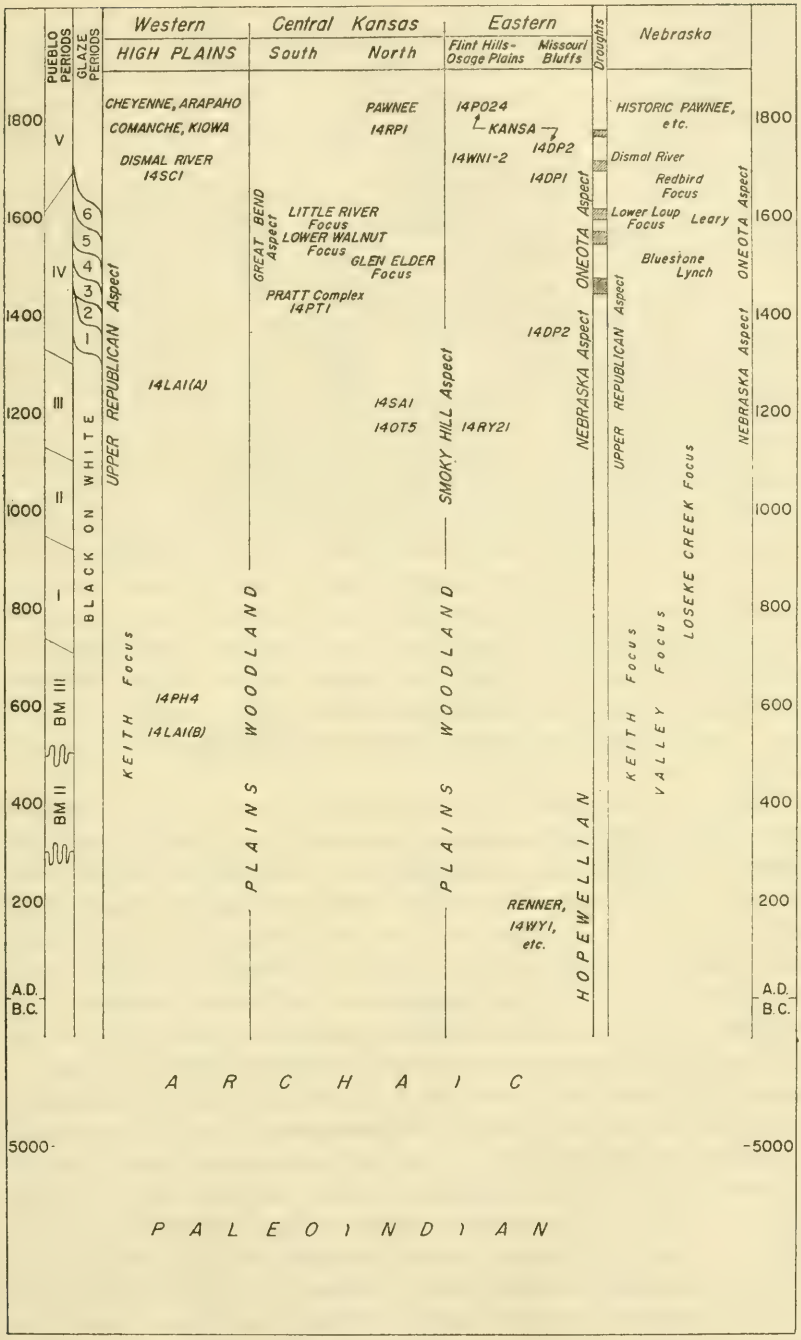

FIGURE 106.—Suggested chronology of certain archeological sites and complexes in Kansas, including provisional correlations with archeological sequences in the Rio Grande pueblo area and in Nebraska. (See pp. 615–620.)

connection is certainly strongly indicated, and there may be some relationship with Oneota; but the relationships to the named foci in Iowa, Minnesota, and Wisconsin are clearly of a very different sort than is implied in the Fanning, Leary, or Stanton materials. On present evidence, inclusion of White Rock Creek and Glen Elder in the Oneota Aspect is not warranted.

In summary, we still know too little about the time of arrival of the earliest Oneota in the trans-Missouri region and the direction from which it came. The traces of Oneota at Lynch and St. Helena, however, seem like very good evidence that its influences were operating west of the Missouri during the final stages of Upper Republican occupation, possibly before A. D. 1500; and Leary, as elsewhere suggested, probably indicates the presence in essentially classic proportions of an Oneota community in the region before A. D. 1600. If these dates are substantially correct, it seems remarkable that there is so little evidence of Oneota in the Lower Loup pottery complex. I know of no unmistakably Oneota sherds from any Lower Loup sites; and there are no Lower Loup sherds from Leary, though several were noted at Fanning. It would appear that Oneota influence on eastern Plains pottery was less pronounced than many of us have supposed. Alternatively, it may be that Leary antedates the Lower Loup sites from which extant collections have been gathered, which proposition might help explain the presence here of a square Upper Republican type of earth lodge instead of a circular structure of Lower Loup form.

Potterywise, probably the chief traits that have led to classification of materials as Oneota are one or more of the following: shell tempering, the combination of straight rims with globular vessel bodies, decoration on the inner rim or lip surface, trailed or incised decoration and punctates on shoulder areas irrespective of design patterns, and presence of strap handles. Some of these features, it is true, make their first important appearance or become markedly more abundant in late prehistoric and early protohistoric times—at roughly the time Oneota appears in the area. Strap handles, however, are common on Nebraska Aspect pottery, probably predating developed Oneota in the eastern Plains; shell-tempering characterizes Middle Mississippi pottery, which is known to have reached the southeastern Nebraska and northeastern Kansas region; and the free use of rectilinear shoulder decoration is not limited in its occurrence to Oneota pottery. Distinctly Oneota design patterns are rare or absent on Lower Loup pottery, and apparently also on such late prehistoric and protohistoric manifestations as Scalp Creek, Arzberger, Lynch, Redbird, and White Rock. More plentiful is a basically triangular arrangement of contiguous blocks of oppositely slanted parallel lines repeated about the vessel shoulder. This has a wide distribution on pottery of the Eastern United States, apparently in both Middle and Upper Mississippi contexts. Whatever its derivation, this is not Oneota; but its wide spread along the eastern Plains and in the Missouri valley offers an interesting problem whose closer examination might well contribute to solution of other problems on this general time level in the region. The same motif occurs, curiously enough, on Potsuwii Incised pottery from the Chama Valley in north-central New Mexico at approximately the 1400 A. D. time level (Jeancon, 1923, pp. 54–57; Wendorf, 1953, pp. 55, 98).

That the relatively few Oneota sites now known west of the Missouri represent a continuous residence in the region by Oneota peoples seems improbable. They impress me rather as repeated incursions from the east, probably varying in strength and duration, beginning perhaps before A. D. 1500 and continuing for an undetermined period thereafter. The final stages of Oneota in the trans-Missouri region must await further investigation of late 17th and 18th century sites of the Chiwere and Dhegiha groups in the area.

## TIME PERSPECTIVE

Chronological arrangement of the various Kansas sites and culture complexes discussed in the preceding pages can be done by several lines of evidence and in varying degrees of preciseness. This problem has two facets: (1) relative dating, or the determination of the time of a site or culture with reference to earlier and later sites and cultures; and (2) absolute dating in terms of our own calendar. In both respects, the present task has been materially lightened by the marked advances made in surrounding areas and also in dating methods since completion of the 1937–40 fieldwork of the U. S. National Museum.

For some of the late sites that have come under investigation, there is historical documentation by White explorers and other visitors that makes possible determination not only of the time of occupancy but also the tribal identity of the native inhabitants. Other sites show varying degrees of Euro-American contact in the form of metal, glass, and other materials of nonaboriginal origin; and, since such alien materials usually became increasingly important and plentiful among the Indians after their introduction about the 16th century, their relative amount in a given site inventory permits some inferences as to age. This method, of course, gives relative rather than absolute time determinations. For pre-White contact sites, stratigraphy or the superimposition of culture layers is the most reliable indicator of the succession of cultures, but again does not tell precisely where a specific site or layer belongs in time.

An approximation of absolute dating has been possible in a few instances. The finding in Kansas sites of Southwestern pottery fragments representing types whose span of existence in New Mexico has been accurately dated through tree rings is an important clue to chronological equivalence of certain Central Plains and Southwestern cultures. The application of dendrochronological methods to Plains sites has not been carried very far, but a few 18th century sites of the Dismal River Aspect have been plausibly so dated in Nebraska; and at Ash Hollow Cave an early 14th-century date for an Upper Republican layer rests on the same sort of evidence. Finally, there are radiocarbon dates for several prehistoric sites that offer helpful clues to the probable position of some of the earlier cultures now recognized.

The time relationships of the Kansas materials, as I see them at the moment, have been charted in figure 106, to which the present discussion is supplementary and explanatory. Further details have been brought together in the descriptions of individual sites and in the reviews of the various complexes represented. The sections of the chart dealing with Rio Grande sequences have been prepared with the generous assistance of Mr. Stanley Stubbs, Museum of New Mexico (letter of March 25, 1957).

As is to be expected, the most recent sites are also the most firmly dated. The Manhattan or Blue River site (14PO24) is the location of the main Kansa village of ca. 1800–30, where the tribe was visited in 1819 by Professor Say of the Long exploring expedition. The Kansas Monument site (14RP1) can be safely identified with a Pawnee village dating from approximately the last quarter of the 18th century, and in all likelihood abandoned before 1800. The concurrent occupation in western Kansas was entirely by equestrian bison hunters—the Comanche, Kiowa, Cheyenne, Arapaho, and other tribes, whose legacy to archeology was of the most meager sort.

Three other sites are assigned to an 18th-century dating, ante 1750. In northeastern Kansas, the late component burials and caches at Doniphan (14DP2) are accepted as affiliated with the site of the Grand village of the Kansa visited by Bourgmond in 1724. The "El Cuartelejo" site in Scott County, 14SC1, is assigned to a slightly earlier date—partly because of Tewa Polychrome sherds and incised Pueblo pottery pipe fragments identified by Mera as belonging to the "last two decades of the 17th up to the early years of the 18th centuries," and partly because of the essential similarity of the site inventory to other Dismal River sites in Nebraska dated to the early 18th century by dendrochronological and other methods. Moreover, as I have indicated in the discussion of this site, there seems to be a reasonable likelihood that it was one of the Cuartelejo Apache rancherias from which Ulibarri in 1706 rescued a number of Picuris captives or fugitives. In southeastern Kansas, the Neodesha "fort" (14WN1) and nearby village site (14WN2) are tentatively allocated to the first quarter of the 18th century on what I cheerfully concede is inadequate evidence. I have elsewhere indicated my views regarding the possible identification of these remains as Wichita of perhaps the time of Du Tisné.

The Fanning site, 14DP1, is clearly a relatively late Oneota manifestation—certainly later than the nearby Leary site. It probably dates from the latter half of the 17th century, perhaps even from the final quarter. The probability seems good that it is identifiable with a Kansa occupancy.

The Great Bend Aspect is appreciably earlier than any of the above, though in part certainly post-White contact. The partly inclusive presence at several sites in Rice and Cowley Counties of Rio Grande glaze paint sherds dating from circa 1525–1650, and surface finds in the same localities of other Pueblo pottery types running from the late 15th to the early 18th centuries, probably bracket the occupation fairly closely. The historical and archeological evidence linking these sites with the Quivira villages visited by Coronado in 1541 and Oñate in 1601 has been summarized previously in this paper and elsewhere. The Great Bend aspect is probably approximately contemporaneous with the Lower Loup Focus in Nebraska, as indicated by broad and consistent similarities in the cultural inventories of the two complexes, and the evidence of direct contact shown by cross finds of potsherds. These include the discovery by Udden (1900, fig. 10) in one of the Paint Creek middens of a large vessel fragment done in unmistakable Lower Loup style, and the finding of shell-tempered, flat-based vessel fragments of Lower Walnut Focus type in a house ruin at the Gray site in Colfax County, Nebraska.

The Pratt complex, though very inadequately known as yet, is dated earlier than Great Bend because of (1) the presence of Rio Grande glaze paint and biscuit ware sherds attributed to the 1425–1550 period, thus preceding slightly the dating indicated for Great Bend; and (2) the general nature of the artifact inventory, which includes a significantly higher proportion of cord-roughened grit-tempered pottery than Great Bend and also shows other similarities to late prehistoric cultures of Oklahoma. The finding of a glass bead is not wholly consistent with such a dating, nor, perhaps is the presence of what seem to be Dismal River sherds. Since the available materials are all surface finds, it is quite likely that there has been some mechanical mixing of specimens from two or more separate occupations. I recognize the urgent need for systematic excavation at this site, and in any related ones that may be found in the southern

Kansas area; and meanwhile record my feeling that it precedes typologically, and may be in part ancestral to, the Great Bend Aspect.

The Glen Elder Focus may belong to the same general time level as Pratt, but appears to me to find more congenial company on the Great Bend-Oneota level. The general absence of White contact material suggests a dating not later than the early 16th century; if the complex had been significantly later in time, I would expect in its trait inventory (Rusco, MS.) some recognizable ceramic or other evidence of direct contacts with the Lower Loup Focus and the Great Bend Aspect, these cultures having flourished in some strength not far to the north and south, respectively, of the Glen Elder locality.

For the Upper Republican and Nebraska Aspects I have suggested an earlier dating than those usually given heretofore (Wedel, 1947 a, fig. 51; Champe, 1946, fig. 17; Lehmer, 1954 b, fig. 1). The reasons for this, and for proposing a new Smoky Hill Aspect on the same general time level, have been discussed elsewhere herein. There are, unfortunately, no records of datable Southwestern sherds found inclusively in any sites of this general culture stage in Kansas and Nebraska. This contrasts with the situation in the related Antelope Creek Focus of the Texas Panhandle, where "potsherds centering about the Rio Grande glazes of periods I and II, but also including St. Johns polychrome" have impelled Krieger (1947, p. 143) to set a date of circa A. D. 1300–1450. The absence of Southwestern pottery in Upper Republican sites in western Kansas may well reflect the extremely limited excavation done so far there; but the same explanation cannot be invoked for southwestern Nebraska, where the recent large-scale operations and much previous digging on a smaller scale at Medicine Creek have failed to turn up a single identified sherd of Pueblo origin. Geographically, the Medicine Creek locality is no more remote from the upper Rio Grande than is the Great Bend region of central Kansas, to which puebloan influences penetrated repeatedly in the 15th century and later. This may mean that the Upper Republican hold on the High Plains between the Arkansas and Platte Rivers was already slipping by the time glaze-paint decorated pottery was establishing itself on the Rio Grande, and that the earth-lodge village-dwellers were moving northeastward toward the Missouri River.

Note has been taken elsewhere of a radiocarbon date of A. D. 1176 ± 150 years for "an Upper Republican site in the middle period . . . of this culture" (Crane, 1956, Sample M–113) in Clay County, Kans. The associated cultural materials here have not been described in print, so far as I am aware; nor do I know just what features differentiate a "middle period" Upper Republican site from any other assignable to this aspect. The location of the site on the

Lower Republican suggests that it may fall into what I propose to call the Smoky Hill Aspect rather than into Upper Republican as known from farther west and northwest. In any case, the date, if valid, points to an earlier time level than has been indicated by most previous estimates.

The presence of Crockett Curvilinear Incised pottery at another Smoky Hill site (14SA1) suggests contemporaneity with some Gibson Aspect sites of the lower Arkansas-Red River area. This ware occurs in the Spiro Focus where, as we have noted, radiocarbon dates fall into two widely disparate groups—one at circa 330 B. C.±200 years, the other at A. D. 1316±250 years. Krieger (Suhm, Krieger, and Jelks, 1954, p. 262) assigns the type to "more or less entire time span of Gibson Aspect, some part of 500–1000 A. D."; but in his characterization of the Haley Focus, where Crockett Curvilinear Incised is listed, he gives the chronological position as "some part of span 800–1200 A. D." (ibid., p. 182). In this light, the placement of site 14SA1 in figure 106 may be conservatively late.

I know of no radiocarbon or other "precise" dating for the Nebraska Aspect. Its partial equivalence with Upper Republican on one hand, and with some variant of Middle Mississippi on the other, suggest the placement shown on the chart.

The entries for Plains Woodland and Hopewellian also represent a considerable downward revision from previous suggested chronologies. The revision is based, in part, on recent radiocarbon determinations. Not enough of these are at present available for the Central Plains area to permit satisfactory evaluation, but those now at hand suggest that some of the Plains Woodland complexes may have to be allowed a greater time span, an earlier appearance in the area, or both, than has been indicated in figure 106. For Kansas City Hopewellian, for example, there are four radiocarbon determinations from the Renner site: A. D. 8±250 years (M–572); A. D. 108±200 years (M–571); A. D. 438±200 years (M–573); A. D. 687±250 years (M–454). It is in the highest degree improbable that the Renner site was occupied for six centuries, or that Hopewellian peoples reoccupied it at different times during a period approaching that length. I have assumed that a date in the second or third centuries of the Christian Era probably approximates the time of occupation. Other related sites in the district may be earlier or later than Renner.

As to other Plains Woodland complexes, the Keith Focus and sites that appear to be fairly closely related to it are represented by the following C14 determinations: Woodruff ossuary (14PH4), A. D. 611±240 (C–928); Massacre Canyon, Nebr. (25HK13), B. C. 122±250 (M–181, Crane and Griffin, 1958, p. 1121); site 25FT18, Frontier County, Nebr., A. D. 828±200 (M–841). These figures have a much wider spread (950 years), and suggest a much earlier occurrence, than I have shown in figure 106. The oldest date, M–181, is based on fresh-water shell, the others on charcoal.

There is but one date for the Valley Focus, based on fresh-water shell from the type site, 25VY1. Reported as "regarded by the collector as much too old," this date is B. C. 1872±300 (M–182, Crane and Griffin, 1958, p. 1121). It is entirely possible that Valley Focus should be allowed a much longer time span than I have indicated in figure 106; but I, too, would prefer further confirmation before accepting the one date now at hand.[50]

Since almost nothing is known of the preceramic occupations of Kansas, I have not attempted their placement on the chronological chart. If, as present radiocarbon datings suggest, the Woodland and Hopewellian manifestations were present in the area in the early centuries of our era, any Archaic materials whose existence and exact nature here may be established in future will probably be acceptable as belonging to a pre-Christian time horizon. That man was present here several millennia ago is certainly suggested by the recurrent surface finds of paleo-Indian materials, including Plainview and Folsom types of projectile points, elsewhere dated by radiocarbon at eight to ten thousand years before present. The association at Twelve Mile Creek of a projectile point with skeletons of *Bison occidentalis* establishes man's presence here at a time when faunal forms now extinct roamed the area; and similar associations in adjacent States strengthen the likelihood of further finds of this sort in Kansas. Development of this problem, however, is for the future, since, toward these early stages of man's existence in Kansas, our own work contributed little. I can add only my conviction that the prospects for further and more significant finds along this line are excellent.

## INTERPRETATIONS

The data on Kansas archeology gathered by the United States National Museum in 1937–40 are now before us. So, also, are most of the essential available archeological observations on the State that have been published, summarily or otherwise, in various journals and other papers. So far as seems warranted, the sites have been classified and assigned to the larger regional groups to which they seem related (table 18); and a provisional scheme of chronological relationships has been offered (fig. 106). There remains now the matter of interpreting and integrating the materials; and this can perhaps best be done by a provisional historical reconstruction.

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[50] For permission to include here Plains Woodland and Hopewellian dates not yet published when the proof sheets left my hands, I am obligated to James B. Griffin, James H. Howard, Carl H. Chapman, and Robert L. Stephenson. These determinations were made by Crane of the University of Michigan.

The tentative nature of any such attempted reconstruction at this time must be emphasized at the outset. Geographically, the material at hand affords only a very spotty and incomplete coverage of the Kansas area. Large sections of the State remain unsurveyed by archeologists—or, if surveyed, the results have not yet been made generally available. Again, the operations of the U. S. National Museum were concerned almost wholly with Indian remains of the potterymaking cultures of the past 1,500–2,000 years—very largely, indeed, with those of the last half of that period. Even here, the sampling has been necessarily limited and often inconclusive. Still unsampled and untested are several thousand years of time preceding our era, and many hundreds of miles of river and creek valleys in all parts of the State.

Partially offsetting these deficiencies is the obvious fact that the aboriginal cultures of Kansas did not originate or develop in complete isolation. Throughout, they participated in various ways in developments that also involved peoples and cultures in adjacent areas. It is possible, therefore, to evaluate the available Kansas survey data in light of the much better-known materials in Nebraska and other neighboring States, where the range and sequence of aboriginal cultural development have been emerging with increasing clarity for more than two decades.

It seems entirely reasonable to postulate the presence of man in the plains and stream valleys of Kansas at least as early as eight to ten thousand years ago. By this time, the Kansas landscape had probably acquired substantially its present form with respect to topography, drainage pattern, and native flora and fauna. The moist cool climate attending the last Wisconsin (Mankato) glaciation of the Midwest was giving way to a drier climate, apparently to a climatic regime characterized, like that of the present, by "extremes of aridity and high temperature in summer, followed by cold dry winters . . ." (Frye and Leonard, 1952, p. 180). Climatic fluctuations from time to time can be inferred, and some of these were probably of considerable magnitude and duration; but their details remain to be worked out. There is no sound reason to suppose that the vegetative cover differed materially from that of the present, with tree-bordered streams and broad grassy interfluvial uplands. The environmental setting, in short, was essentially that which the first white explorers encountered some four centuries ago.

Evidence for man's presence here at this early date is of the most meager sort. It includes no dated campsites, game kills, or human skeletal remains. As we have noted elsewhere, however, scattered finds of well-fashioned Folsom points have been made in the western and northeastern portions of Kansas; and in the northeast, also, there have been finds of points resembling Plainview types. Such surface finds, without definable geologic or faunal associations, are admittedly not very strong evidence. They assume added significance, however, in light of dated finds of similar artifact types in nearby Nebraska and other Plains States. The discovery on Twelve Mile Creek in western Kansas of a projectile point in direct association with several skeletons of *Bison occidentalis* is also relevant, for it establishes contact between early Kansans and a fauna now extinct. Insofar as there is anything diagnostic in the point types thought to represent this early time level, the relationships appear to have been with western Plains manifestations rather than with early eastern complexes.

As to the probable nature of this postulated early occupancy, no details can be offered on the basis of the Kansas data alone. By analogy with other finds in adjacent areas, however, it is possible to suggest what may be expected when Early Man or Paleo-Indian sites eventually come to light in Kansas. Throughout the western Plains, the remains of these early big-game hunters are associated with bone beds, evidently the results of game kills or butchering activities, and campsites. From such locations comes little or no information regarding the size, composition, and organization of the original communities. There are usually no structural evidences, posthole configurations, or food-storage devices, such as pits. Hearths may occur, but they are usually scarce and rarely give evidence of long-continued use. The artifact inventory is almost wholly limited to items of stone, but sometimes includes a few bone implements. The implements are primarily those designed for the chase and for processing the kill—projectile points, scrapers, knives, and choppers. There are few or no grinding tools or other items suited to the gathering and processing of vegetable foods, nor is there evidence of the dog.

Inferentially, the population was a sparse and scattered one, essentially nomadic, and possessed a subsistence economy closely linked to the large grass-eating herd animals. The local groups were probably of very limited size, perhaps consisting for most of the time of small family units. The habitations were very likely light, impermanent dwellings of poles covered with skins or grass thatch, and frequent shifts of residence doubtless took place in accord with availability of game and other foods, the needs of the seasons, and other circumstances. Although most associations of early artifact types are with skeletal remains of large mammals, it is very probable that the yearly round of economic activities included also the harvesting of roots, seeds, and berries in season. Winter residence in sheltered localities where game, water, and fuel were obtainable can be inferred.

The subsistence economy outlined above must be characterized as one of food collecting, not food producing. A more or less similar basic economy undoubtedly was followed also by the peoples who, inferentially, followed the western Paleo-Indians in the Kansas region before beginning of the Christian Era. In the Eastern United States, these later peoples, nonhorticultural and lacking also the potter's art and mound burial, have been assigned to the Archaic stage. Subsisting primarily by hunting, but doubtless with some gathering and perhaps fishing, these people made a variety of side-, base-, and corner-notched projectile points, lanceolate points, blades, hafted scrapers, and choppers. From sites of later phases have come such ground stone implements as celts, grooved axes, boatstones, and gorgets. Bonework includes awls, needles, tubes, shaft wrenches, and long slender hairpins with expanded butts. Antler and shell artifacts are also known. Cave deposits in central Missouri have yielded burned clay with impressions of twined textiles and coiled basketry. Deep accumulations of refuse suggest that these communities sometimes persisted for long periods of time, presumably by relying on hunting in forested areas rich with game that moved about less than did the bison herds on which the Paleo-Indians of the West depended.

For the Archaic level, there is only meager and uncertain evidence at present in Kansas. I have suggested elsewhere the possibility that the coarsely chipped points, choppers, scrapers, and other tools of the northern Flint Hills region—perhaps including the "paleoliths" described by Winchell—may represent an Archaic level. Long bone hairpins with expanded butts, and other elements found at the Younkin site near Junction City, have also been interpreted as a survival of Archaic traits. The demonstrated existence in Missouri of a long and varied Archaic occupancy and the occurrence of other Archaic materials in northeastern Oklahoma makes highly probable the ultimate recognition of related manifestations in the once heavily timbered river valleys of eastern Kansas. The Nebo Hill complex of the Kansas City locality may well have extended across the Missouri Valley trench into northeastern Kansas, though I am not aware that the characteristic lanceolate blades of this manifestation have yet been found or recognized in the State. Possibly "Lansing Man" should be allocated to an Archaic level, but this must be regarded as an inconclusive point. Farther west, it seems very probable that preceramic campsites and artifacts will ultimately be recognized in alluvial stream deposits and that some of these materials will be assignable to an Archaic hunting-gathering level.

If we can accept the accuracy of radiocarbon datings, present evidence suggests that pottery making and maize horticulture reached the eastern Kansas area by or during the early centuries of the Christian Era. The oldest dated remains with which corn has been found associated are the Hopewellian communities of the Kansas City locality, inhabited probably before A. D. 400.

As represented at the Renner and Trowbridge sites, these Hopewellian settlements appear to have been fairly stable communities. No definable structural remains have been found but there are numerous storage pits of small to medium size. The sites are generously mantled with village refuse, including potsherds, worked stone and bone, and considerable quantities of refuse animal bone consisting chiefly of deer and other woodland forms. There is no information as to the type of dwelling or the arrangement of dwellings within the occupied area. Burial mounds of earth, containing square or rectangular dry masonry chambers with entranceways, occur on the bluffs near these villages and are believed to be associated with them.

Except in their lack of discoverable house remains, the Hopewellian peoples seem to have possessed a type of life much like that of later semihorticultural Village Indians of the eastern Plains. The artifact inventory is a comparatively rich and varied one, at least by comparison with preceding and contemporary residents of the region. It includes heavy stemmed and corner-notched projectile points, end and side scrapers, flake and other knives, and other chipped tools; grooved axes, celts, mammiform objects, and other items of ground stone; metapodial and deer ilium beamers, turkey metatarsal and mammal bone awls, large and small needles, longitudinally pierced deer phalanges, imitation bear canines, and various unidentified objects of bone; dressed subcylindrical and curved sections, socketed projectile points, and other artifacts of deer antler; and some native copper. Pottery occurs in quantity; all of it is grit tempered. At least two wares are represented: a cord-roughened minority ware with punched exterior bosses below the rims of tall conical-bottomed jars; and a more carefully made smoothed ware, including jars and bowls, commonly bearing rocker-roughening, dentate-stamping, or roulette impressions which are sometimes in zoned arrangement.

The closest relationships of these people appear at the moment to have been with the Illinois Hopewellians. The westward thrust represented by the sites at Kansas City spread only a little way farther up the Missouri, apparently stopping short of the Nebraska line; but there was also a movement up the Kansas River to Junction City or beyond, as well as a southward spread from the Kansas River valley into northeastern Oklahoma. The details of these movements, whether cultural, ethnic, or both, remain to be worked out. Essentially, it seems that the Hopewellian occupation of the eastern Plains was restricted to the eastern third of Kansas, and that village sites of any size or permanence are not likely to be found west of the area assigned by physiographers to the Central Lowland province.

Apparently contemporaneous in part with the Hopewellian communities of the eastern Plains were other peoples with a much ruder culture who inhabited the Plains to the west and northwest. These were the bearers of what has long been recognized as Plains Woodland culture. There are several recognized variants, all with pottery but most without clear evidence of horticulture. Here the sites are usually small and inconspicuous, often deeply buried in stream terraces, and with a wide distribution along the smaller rivers and creeks of Kansas and Nebraska. In Nebraska, comprehensive excavations have disclosed shallow basins from 15 to 18 feet in diameter, sometimes with hearths, and suggesting habitation units. Comparable features have not been reported from Kansas Woodland sites. The habitations are thought to have been of light construction, perhaps of poles covered with grass thatch, bark, or skins, and seldom numbering more than half a dozen single-family units per site. Burials include both single primary and massed secondary interment, the latter in what appear to have been communal cemeteries resulting from prolonged, but not necessarily uninterrupted, localized residence nearby.

The artifact inventory of these western Woodland peoples is much simpler and less varied than that found at Hopewellian sites. It includes stemmed and corner-notched projectile points, end scrapers, unbeveled knives, sandstone sharpening blocks, split metapodial and splinter awls, bone tubes, hollowed bison phalanges, and sometimes bone "knives" fashioned from scapula fragments. Pottery is characteristically grit tempered and cord roughened, with large jars typical, but apparently much less plentiful than in Hopewellian and later sites and complexes of the ceramic period. Missing are such common later Plains artifact types as bison scapula hoes, diamond-shaped beveled chipped knives, and longitudinally grooved sandstone shaft smoothers; and these items are also absent from the western Hopewellian assemblages.

The chronological and other relationships between the various Woodland complexes now recognized in the Central Plains and the more highly developed Hopewellian culture in their eastern portion are not entirely clear. A minority ware at the Hopewellian sites, as we have noted, is a heavy, gravel-tempered, cord-roughened pottery reminiscent of that which characterizes many of the westerly Woodland sites. Partial contemporaneity or overlap is suggested. These minority sherds at Hopewellian sites resemble those attributed in Nebraska to the Valley Focus type, and it thus seems likely that this manifestation or variants of it were present in the area at least as early as Hopewellian. Similar sherds have also been found in association with the later Loseke Creek Woodland variant, suggesting further that the Valley type may represent a basic and long-lived Woodland pottery that arrived in the Central Plains as early as Hopewellian, if not indeed before, and survived after the latter culture had disappeared. Until radiocarbon dating has been applied to Valley Focus materials or direct stratigraphic evidence is found, the question of priority in time as between Valley Focus and Kansas City Hopewellian must remain conjectural.

Other than the Hopewellian, most Woodland sites in the Kansas-Nebraska region suggest a simple creek-valley hunting and gathering economy, with relatively small population aggregates. Squash and gourds in the Sterns Creek variant suggest horticulture, as does charred corn in Loseke Creek, neither of which manifestations has yet been reported from Kansas. The bones of deer, elk, and smaller woodland margin mammals and birds often predominate over those of bison in the refuse deposits; but it is not clear whether this reflects food preferences or, alternatively, hunting and butchering methods. This point I have discussed at greater length elsewhere in the present paper.

The time span of the Middle Woodland-Hopewellian occupation of the Central Plains is still undetermined. The few scattered radiocarbon dates now available suggest that both Keith Focus and Valley Focus may predate the beginning of the Christian Era and also the appearance of Hopewellian peoples on the eastern margin of the Central Plains. Two of the three Keith Focus dates, on the other hand, are later than three of the four Renner dates; and the third, like the only extant Valley Focus date, was derived from fresh-water shell rather than charcoal. Loseke Creek has not been dated, but it would appear to be certainly post-Hopewellian and probably more recent than either Keith or Valley Focus. It seems probable that the Hopewellian sites in the Kansas City–Kansas River valley area represent a relatively short-lived thrust, in the early centuries of the Christian Era, westward from the Mississippi Valley into an area dominated before and probably afterward by a varied assortment of simpler hunting-gathering and, later incipient horticultural, peoples generally classed as having Middle Woodland affiliations. I see no real evidence of continuity in the Central Plains between the relatively stable Hopewellian communities and the almost certainly much later semisedentary village dwellers to whom we come next.

Some time after circa A. D. 1000, but still several centuries before arrival of the first White men in the Central Plains region, the Middle Woodland-Hopewellian complexes were succeeded by a group of semihorticultural pottery-making cultures implying a much more stable pattern of settlement. Here there is direct and convincing evidence of cultivation, with subsistence based in part on a small scale hoe-linked maize-bean-squash-sunflower horticulture and in part on hunting, fishing, and gathering. Included in these semisedentary complexes were several prehistoric manifestations featuring small, loosely arranged, unfortified settlements—the Nebraska Aspect of northeastern Kansas and eastern Nebraska, the Upper Republican aspect of western Kansas and Nebraska, and the related Smoky Hill Aspect sites in central Kansas.

Highly characteristic of these cultures—collectively subsumed under the designation of Central Plains phase or tradition—are remains of substantial earth-covered lodges. Square to rectangular in floor plan, with rounded corners and extended entranceways, these were generally much larger than the dwellings inferred for the earlier Woodland peoples, and were probably designed for larger extended family groups. In the Nebraska Aspect, largely restricted in Kansas to the immediate bluffs of the Missouri, the settlements consisted of scattered houses usually irregularly disposed along the tops of narrow ridges and bluffs; terrace locations seem less characteristic, though they may well exist along some of the short creek valleys draining into the Missouri. Deep pits marking these sites indicate that the lodges were often semisubterranean, with the floors from 2 to 4 feet or more beneath the ground surface. Farther west, Upper Republican villages and apparently those of the Smoky Hill aspect in the lower Kansas River drainage, stood on terraces or on bluffs immediately overlooking the lesser streams and creeks. For the most part, these houses stood on or but a few inches beneath the ground surface and are not properly called pithouses. Single lodges were scattered randomly at intervals of a few yards to several hundred feet; in other instances, clusters of two to four lodges were similarly separated from other small clusters or single units. One or more small subfloor cache pits, cylindrical or bell shaped, were to be found in each of these habitations; and small refuse dumps often occur nearby. The highly diffuse pattern of settlement found at village sites of the Central Plains phase was ill adapted to fortification; nowhere has any evidence of defensive works been noted; and relative freedom from enemy raids seems to be generally indicated.

For these small scattered rural communities, probably seldom exceeding 100 souls and often much smaller, the nearby creek bottoms doubtless provided ample garden lands, and game could be obtained by foot hunters in the brushy valleys and along the upland margins. Inferentially, though the scale of horticulture here was more limited than in protohistoric times, the basis of life would seem to have been a more secure one than in the preceding Woodland stage; and this is reflected in the greater amounts of refuse and more abundant artifacts of pottery, stone, bone, and other materials. Thus, for example, the floors of single Upper Republican house sites have been known to yield fragments of more pottery vessels than have come from the three or four probable habitation units comprising an entire Woodland site. The nature of the pottery and other artifacts from the various complexes included in the Central Plains Phase has been reviewed in a preceding section.

The westward distribution of the small earth-lodge communities of this period in Kansas remains to be worked out in detail. It has already been shown in Nebraska that such settlements were widespread along the smaller streams tributary to the Elkhorn, Loup, Platte, and Republican Rivers, and that their distribution extended to almost all localities where climate and soils permitted creek-bottom gardening, dependable water for domestic use could be found, and timber was available for building purposes. There seems to have been a preference for residence on small streams, perhaps because timber was more readily available here than on the larger and more open river valleys. The upper reaches of such streams as the Solomon, Smoky Hill, and Saline, as also the northeast-flowing tributaries of the upper Republican, would seem likely localities for searching out additional evidences of similar village sites in Kansas.

The origins of the Central Plains tradition remain to be worked out. That it is basically of eastern or southeastern derivation seems clear. The square earth lodge is well known from prehistoric cultures farther south, in eastern Oklahoma and Arkansas; and as we have seen, there is direct evidence of contacts between Smoky Hill valley sites and the lower Arkansas valley. More accurate determination of chronology in the two areas is needed before we can be certain of the significance of the contacts. Meanwhile, the general prevalence of cord-roughened grit-tempered pottery, the hoe complex and associated domesticates, the common use of curved-bone fishhooks, and the broad parallels in other items of material culture between the prehistoric Central Plains and Late Woodland materials in the eastern United States all point, I think, to the direction in which most of the important Central Plains traits were rooted. Evidences of Southwestern contacts with the prehistoric Central Plains tradition of Kansas and Nebraska are lacking, despite some fairly extensive investigations in the western Upper Republican area; and if the Upper Republican people derived their house type from the northeastern Pueblo area (Jennings et al., 1956, p. 87), it seems strange that so little else in their material culture points in that direction. I have already indicated my agreement with Spaulding's suggestion that a simplified version of the Central Plains tradition may ultimately be recognized, out of which the Nebraska and Upper Republican Aspects specialized to the east and west, respectively, perhaps from something like what I have termed the Smoky Hill Aspect.

The relationships of the complexes to later cultures of the Central Plains also await further investigation. No direct connection has yet been demonstrated between the Nebraska Aspect and the later Siouan peoples of the eastern Plains, or between Upper Republican and the Pawnee who followed it in the region farther to the west. There are numerous similarities between Upper Republican and Lower Loup Focus, which is generally regarded as Pawnee; but no transitional or intermediate sites have been found in Kansas that can be regarded as part of a cultural sequence clearly connecting the prehistoric cultures with historic tribes. There is a small percentage of cord-roughened sherds in Great Bend Aspect sites in central Kansas; but it has not been shown that they are a survival from Upper Republican times or, even if they were, that they establish an Upper Republican ancestry for the Great Bend peoples.

Transitional sites may yet be found, of course; but there is growing evidence that they lie outside, or peripheral to, the Central Plains. Many of the Upper Republican sites are associated with old soil horizons believed to represent former land surfaces subsequently mantled by a few inches to two feet or more of wind-blown deposits. The overlying materials may reflect diminished rainfall, decreased vegetative cover, and increased soil movement which, in turn, suggests a possible climatic basis for abandonment of the old villages. The Upper Republican communities, as we have seen, were pushed far westward into a region of low uncertain precipitation which, even in normal years, borders on the minimum required for successful corn growing; and they must have been vulnerable to the intense droughts and hot winds that are a characteristic feature of the regional climate. Even the creek bottom gardening of the Indians was not necessarily safe from such climatic hazards, as I have pointed out elsewhere (Wedel, 1941 a, 1953 a); and prolonged droughts, with widespread drying up of springs and watercourses, might well have been an important factor in forcing the Upper Republican horticultural communities out of their habitat in western Kansas and Nebraska, perhaps toward the east or north. That such droughts occurred in prehistoric times is indicated by tree-ring studies in western Nebraska (Weakly, 1940); and the one thus dated at 1439–1468,[51] if very widespread, may account for abandonment of the westerly Upper Republican area well before the arrival of the first Spanish in the central

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[51] "I am inclined to believe that the 1459–68 and 1439–54 periods are not actually separate droughts but constitute a single protracted one with not quite so severe conditions between 1454 and 1459. These years were certainly subnormal . . ." (Weakly to Wedel, letter of March 28, 1957).

Kansas region. The strong element of Upper Republican material culture manifested in late prehistoric sites in northeastern Nebraska, such as Lynch and St. Helena, as well as farther north at Arzberger, suggests where the bearers of Upper Republican culture went after their presumed departure from the earlier habitat in the west Central Plains.

It is not possible to state with certainty to what extent or for how long the inferred northward drift of Upper Republican peoples in the 15th century left the Kansas region unoccupied or when new peoples moved into the area. In the southern part of the State, the still very imperfectly known Pratt complex suggests a middle or late 15th-century northward thrust from some of the late prehistoric complexes of Oklahoma. So far as available sherd samples, stone, and bone artifacts are indicative, this complex apparently shares more with the Custer and Washita River Foci than with Upper Republican. There are also resemblances to the Panhandle Aspect, but perhaps less pronounced than those between the latter and Upper Republican. A semihorticultural subsistence economy is indicated, but nothing is known of the house types or settlement patterns. Of some interest is the fact that here occur the earliest clear-cut instances of Pueblo pottery in association with a pre-White contact Kansas complex. Further investigations at Pratt, or in any related sites that may be found south of the Arkansas River in Kansas, are urgently needed.

Farther north, inferentially also in the late 15th century, appeared a different complex represented by the Glen Elder Focus. House types and the settlement pattern are again uncertain. Ceramically, an Upper Mississippi culture is indicated, but with a little simple stamping and cord roughening also present; and the meager artifact inventory otherwise points to participation in widespread traits commonly found in other late prehistoric and protohistoric complexes of the Central Plains. The possibility that Glen Elder represents a Kansa occupancy suggests itself, but this cannot be demonstrated by any evidence now in hand.

The earliest archeological remains in Kansas showing contact with white men are those around the great bend of the Arkansas River in the central part of the State. These have been assigned to the Little River Focus, in turn identified with the Quiviran (Wichita) Indians met by Coronado in 1541. A slightly deviant manifestation farther down the Arkansas, near its juncture with the Walnut, has been designated the Lower Walnut Focus. This and the Little River Focus at present comprise the Great Bend Aspect.

There are marked differences between these sites and those of the earlier Central Plains phase. Great Bend Aspect sites are frequently larger, may be more compactly arranged, and include refuse mounds and great numbers of storage pits. The dwelling type has not been determined archeologically, and it seems doubtful that the earth-lodge, either square or circular in form, was present. At the same time, there appear to have been specialized structures ("council-circles") in some of the villages for which no counterpart is known in the prehistoric sites. Hunting was probably fully as important as in earlier times, with bison bones especially plentiful in the refuse deposits. There is also evidence of a well-developed and intensive maize horticulture. Charred ears of corn, well filled out and bearing 10, 12, and 16 rows of kernels, have been found; and the abundance of storage pits, ranging up to 8 feet in diameter and 10 feet in depth, suggests crop surpluses much larger than those of earlier peoples. Numerous bison scapula hoes and grinding implements seem confirmatory.

The material culture inventory shows notable differences from that of the prehistoric peoples. Probable absence of the earth lodge has already been noted. Missing also from Great Bend Aspect sites are bone fishhooks, bent tubular clay and equal arm stone pipes, and smooth-bladed fleshing tools of mammal leg bone. The longitudinally grooved sandstone shaft smoother continues in large numbers, as does the rib arrowshaft wrench, beveled diamond-shaped knife, and the lanceolate knife. The cord-roughened pottery and globular to round-shouldered vessels of the Central Plains phase have given way almost entirely to smoothed and simple-stamped wares, featuring high-rimmed vessels in which height tends to exceed diameter, handles are relatively plentiful, and flat disk bases are often present. Chipped stonework is more abundant and often better made. It includes large numbers of finely made small end scrapers; decided preponderance of small triangular *unnotched* projectile points; numerous diamond-shaped and other beveled knives, including especially a slender two-edged form with lateral notches and rounded butt; large numbers of expanded-base and plain shafted drills; abundant use of fossiliferous Florence flint; and limited use of obsidian. In ground stone, such common Great Bend forms as the following are rare or absent in Central Plains phase sites: grooved mauls of various shapes; large metates and one- or two-hand manos (but compare Smoky Hill Aspect); fine-grained stone shaft polishers; L-shaped, high-bowled stone pipes; perforate and imperforate sandstone disks; and use of catlinite. The following bone artifact types may be added to the above list: socketed bison scapula hoes; flat split-rib and "rib-edge" awls; transversely scored mammal ribs; stemmed projectile points (both round and four-sided in cross section); wedge-shaped cancellous paint applicators; and epiphyseal hide dressers. Glaze-paint sherds, fine-grained stone shaft polishers, and turquoise indicates Southwestern contacts. There is no evidence of the horse or horse gear; but large dogs are indicated, and these doubtless served as draft animals.

Some of the traits just listed, as we have already noted, are widespread throughout the Plains in protohistoric times. They occur at Dismal River sites in western Kansas and Nebraska, dated at circa A. D. 1700 (±50 years), in Glaze levels at Pecos, at Lower Loup sites in east-central Nebraska, and yet farther to the north in the Dakotas. In part, they include items that appear to be of northern derivation, such as simple stamping on pottery, use of catlinite, flat split-rib awls, and perhaps grooved mauls and epiphyseal hide dressers. The toothed flesher, if eventually established for Great Bend, is probably also northern. Others have a more decidedly southern distribution: the socketed or grooved scapula hoe of the Lower Walnut Focus, found also in Sanders, Fort Coffee, and Washita River Foci; L-shaped, high-bowled stone pipes, as in Sanders and Fort Coffee; flat-based pottery vessels, occasionally with handles, and including shell-tempered wares; and the metate-mano complex, with back and forth grinding motion.

The marked increase in abundance and variety of chipped-stone artifacts, and their generally superior workmanship, as compared to the prehistoric chipped-stone industry of the Central Plains phase, has been pointed out elsewhere. For a number of the artifact types that appear at this time, such as "rib-edge" awls, scored ribs, cancellous bone paint applicators, 2-edged flint knives with lateral notches, and round or 4-sided bone projectile points with or without stem, the available comparative data give little or no information regarding time depth and possible source. Determination of the antecedents of the Great Bend Aspect, and relationships of the complex to such earlier manifestations as Pratt, Custer, Washita River, and Antelope Creek, clearly merit careful investigation when more adequate samples are available from these manifestations.

At present, what seems clear is that a diverse series of traits, including several associated with hunting and skin dressing, were combined with older northern and southern items into an assemblage that by the 16th century had spread widely over the south-central Plains and had also come into direct contact with such frontier puebloan communities as Pecos. The similarities between the Central Plains and eastern Pueblos are certainly far more striking and obvious at this level than in any previous one of which we have knowledge at present. The Great Bend Aspect, moreover, looks more like late prehistoric southern (Oklahoma and northern Texas) cultures than does Lower Loup; and the Little River Focus perhaps represents the northernmost extension of Wichita tribes from the south who still retained, ceramically and otherwise, a culture with unmistakable southern flavor. At the same time, to the extent that their subsistence pattern and material culture were oriented toward a bison-hunting livelihood, they were participating wholeheartedly in practices widespread throughout the Plains. By contrast, their Pawnee kindred on the Loup River in Nebraska, possessed a ceramic tradition, house types, village complex, and other traits that linked them with a more northerly pattern. So viewed, the Great Bend Aspect may represent a sort of southern coalescent tradition analogous to that of the historic Village Indians in Nebraska and northward (Lehmer, 1954 a).

The Great Bend Aspect appears at present to be one of the most distinctive manifestations of native culture in Kansas. Systematic work aimed at definition of its geographic extent and variations, and of course the determination of chronology within the complex, are greatly needed. That many more sites exist than we have considered is well known; their examination ought to throw important light on the antecedents of the culture, as well as on its later stages. Touching on the latter problem, perhaps, is the question of identity and relationships of several sites in nearby areas, as for example, the Deer Creek site in Kay County, Okla., and perhaps also the Neodesha "fort" in Wilson County, Kans. Both are apparently later in time than the Great Bend Aspect sites considered in the present paper; whether they represent stages in the withdrawal southward of the Wichita, perhaps under increasing pressures from such alien peoples as the Plains Apache to the west and the Siouan Osage to the east, is one of several intriguing problems for which I do not have the answer.

Of other native Kansas peoples who were contemporaneous with those of the Great Bend Aspect, we have at present no certain evidence. There are, however, two excellent prospects—the Oneota and the Plains Apache. It is entirely probable, I think, that Oneota peoples had already arrived in the trans-Missouri region while the Great Bend Aspect still flourished in central Kansas. The Leary site at the mouth of the Nemaha perhaps represents one such early location. In Kansas, however, the only presently known Oneota site is Fanning, which is pretty certainly late in the picture and may not be directly in the line of descent from Leary. The frequency with which small quantities of European-made materials turned up in the Fanning excavations suggests actual trade contacts of the late 17th or early 18th century, rather than a chance early visit by white men. The possibility must be recognized, of course, that other and earlier Oneota sites will yet be identified in the prairies of eastern or northeastern Kansas, as along the Blue, Republican, or Osage Rivers.

As will be apparent by reference to discussions elsewhere in this paper, the Fanning complex differs widely from that in Great Bend sites. It is clearly of eastern derivation. Ceramically, its strongest affiliations are with Oneota sites scattered from central Missouri through Iowa to southern Minnesota and Wisconsin. Into this basically eastern complex were incorporated various traits more characteristic of the Plains—some use of the earth lodge, deep undercut cache pits, bison scapula hoes, abundant small end scrapers, and boat-shaped sandstone shaft smoothers. Apparently lacking are many of the bone tools highly characteristic of the protohistoric Plains, including "rib-edge" and flat split-rib awls, scored ribs, cancellous bone paint applicators, and hide-dressing tools, as well as the diversified and competent flint-chipping industry found in the Great Bend Aspect sites at the dawn of the White contact period and among the Dismal River peoples in later times. It is tempting to see in the Fanning complex, with its basically eastern affiliations, an early historic site of the Kansa Indians who, in the not long-distant past, were probably a prairie or even a marginal woodland people.

The Plains Apache are represented in Kansas by scattered sherd occurrences and one known village site, all situated in the western third of the State. The single village site, 14SC1, is from a later time than the Great Bend Aspect sites considered in this paper, if we may trust the evidence of Rio Grande glaze paint sherds and puebloan pipe fragments associated with it. A settlement of some size centering around a stone pueblo is indicated, but nothing is known of the usual house forms or of the arrangement of houses within the occupied area. The subsistence economy was probably based primarily on the chase, with some cultivation of maize, squash, and presumably beans. Pottery of rather distinctive and unexciting type was made in some quantities; and there are definite indications of contacts with Southwestern peoples on the Rio Grande, as well as with Europeans. The extent to which Dismal River material culture reflected the widespread Plains pattern, with respect to stone, bone, and other categories of artifacts, has been discussed elsewhere in this paper.

Of the Plains Apache prior to their appearance in Dismal River garb, I know of no archeological evidence in the Kansas-Nebraska region. That they were present in the southern Plains by 1541, and in considerable numbers, is clear from the Spanish documents pertaining to the upper Rio Grande settlements and their surroundings. In the 16th century, the Apache groups east and northeast of New Mexico were reportedly nonhorticultural; and it is not clear just how such nomadic groups as the Querecho and Teya were related to the later semihorticultural Apache found north of the Arkansas River around 1700—that is, after the Pueblo Revolt and several recorded flights of Pueblo Indians to the Plains—and now identified by archeologists with the Dismal River culture. This is part of the larger problem of Athabascan movement into the southern Plains and Southwest, toward which a notable contribution has recently been made. Drawing on ethnohistorical, archeological, linguistic, and historic data, D. Gunnerson (1956) has suggested that the southern Athabascans, including the Plains Apache, arrived in the Texas-New Mexico plains not long before Coronado, perhaps about 1525. Discovering the eastern pueblos, they attempted their conquest; but, unsuccessful in this, they became entrepeneurs of trade between the buffalo plains and the pueblos. The abrupt appearance of a series of nonpuebloan stone and bone artifact types at Pecos in Glaze IV and V times has long been recognized (Kidder, 1932, pp. 43–44, 235, 238) as indicating easterly contacts with the Plains, and at about the time called for by Gunnerson's thesis. Most of these types, as we have noted, are common in Dismal River and Great Bend, and some occur also in other late prehistoric complexes of the southern Plains which precede in time the postulated arrival of the Athabascans. If these artifacts were carried to Pecos by the Teyas and Querechos, as Gunnerson suggests, they were probably acquired by these wandering hunters from earlier residents of the southern Plains represented archeologically by such semisedentary complexes as Antelope Creek, the Custer and Washita River Foci, and the Great Bend Aspect and its forerunners. In any case, it is still true that archeological sites which might be attributable to the early 16th-century Apache "dog-nomads" are unknown or have not been recognized.

The Dismal River sites apparently represent the terminal stage in the Plains Apache occupation of the Central Plains. Those for which acceptable dates are available fall within 25 to 50 years before and/or after the year 1700. By this reckoning, Dismal River culture developed principally in pre-horse days; and the animal which was to become a symbol of the Plains Indians for the next century or more was acquired not long before the final southward displacement of the Apache by the invading Comanche on horseback. This shifting of peoples in the High Plains between the Platte and Arkansas Rivers, as we have seen, appears to have been completed during the second quarter of the 18th century; and by midcentury, the Comanche dominated western Kansas. No archeological sites or materials attributable to the Comanche are known from the region.

At about the time the Apache were being dispossessed by the Comanche in western Kansas, the Kansa in the northeastern part of the State were coming into recorded contact with the French. In 1724, this tribe had its principal town on the Missouri, at present Doniphan. The site is a scant 15 or 18 miles from the Fanning Oneota site, for which a pre-1700 Kansa authorship and French contacts have been suggested. Our excavations at Doniphan yielded only a few cache pits and burials of the White contact period, some of the latter being clearly intrusive into older Nebraska Aspect house sites. No satisfactory evidence of direct relationships to Fanning—or for that matter with any other earlier sites or cultures—were noted. Since our work may not have been in the main village area, archeology can add little at present to the meager picture that has come down to us from the French records. The settlement was apparently a large one, reportedly with 150 lodges and more than 1,000 inhabitants. There is no indication, historical or archeological, as to the type of habitation, nor is there any evidence of stockades, ditches, or other defensive works. The cultivation of maize and other crops was practiced. There were few horses; and on the great tribal buffalo hunts to the west and southwest, the majority of the Indians depended on dogs or on their own backs for transport of baggage and meat. Very little pottery was found by us, nor was there much else in the way of native material culture. I am unable to say whether this is because we were on the edge of the main occupied area or, alternatively, reflects the early disappearance of native arts and industries in the face of growing White penetration. Possibly further search in the Doniphan locality, or at the later Kansa site north of Leavenworth to which the tribe moved when Fort Cavagnolle was established, would disclose more adequate traces of native Kansa culture. Our limited investigations near the mouth of Blue River, where a large compact, but unfortified, Kansa village of 100 or more houses, some of them clearly earth lodges, stood from circa 1800–1830, likewise disclosed very little Indian bone or stonework and no pottery. This looks like further evidence that the Kansa, situated nearer the sources of French contacts, lost their native crafts at an appreciably earlier time than did, for example, the more remote Pawnee in Nebraska.

In central Kansas, between the Comanche of the short-grass plains and the prairie-dwelling Kansa, no village sites of the mid-18th century have yet been identified. The Great Bend Aspect sites had apparently been given up and their erstwhile Wichita inhabitants were withdrawing southward. Sometime during the third quarter of the 18th century, a portion of the Pawnee established themselves in a fortified village on the Republican River not far south of the Nebraska line. No contemporary description of the inhabited community has come down to us; but the remaining traces include some 30 or more house sites, cache pit depressions, and modest earth-wall defensive works. Excavations have disclosed circular earth lodges with 6 and 8 primary roof supports, small quantities of native pottery, stonework, and bone artifacts, and considerable amounts of European (especially French) contact materials. As has been indicated in a previous section, this is the only recorded Pawnee village site in the State, and its abandonment probably preceded the year 1800. A larger village site also attributed to the Republican Pawnee and inhabited until about 1811, stood some 30 miles farther up the Republican in present Webster County, Nebr. The outlines of Pawnee archeology during and after the period represented are fairly well known, and the data and artifact materials from these two sites accord well with the historic Pawnee material culture complex.

So far as the Kansas data are concerned, the known Pawnee and Kansa sites in the State indicate that here, as elsewhere throughout the eastern Plains, the historic native populations were concentrated in a very few large towns, compactly arranged and sometimes fortified, and situated on the banks of the larger streams. Under constant pressure from the west by the footloose Comanche and, later, by the Kiowa, Cheyenne, Arapaho, and Sioux, and from the east by Whites with trade goods, whiskey, and new diseases, the Village tribes were attempting with indifferent success to combine their older horticulture heritage with the newer equestrian bison-hunting economy. Their failure and the resultant cultural collapse in the 19th century, reflected also in the archeological record, are matters of history.

## CONCLUSION

Reviewing our materials in terms of the major objectives listed in the introduction, it must be admitted that only partial success was achieved. Clearly established was the fact that an abundance of archeological materials exists within the State, and the further fact that these show measurable differences from area to area and from one time period to another. Sufficient data were gathered, despite the limited time spent, to permit a tentative but plausible integration of our findings with those made previously in adjacent States in every direction. A major disappointment lay in the fact that the remains of such historic tribes as the Kansa were found in very small quantities and under such circumstances as to preclude any real insights into their antecedents and earlier cultural relationships.

It is abundantly clear that the dearth of published information on Kansas prehistory reflects principally the absence of any systematic or sustained attack on the archeology of the State, not a lack of suitable subject matter. This, of course, should have been clear to all decades ago, both from the carefully drawn reports of such scientists as Udden and Williston, and from the brief but provocative notices by a host of nonprofessional observers. Our investigations, in point of fact, were concerned very largely with sites already known for years, either from the scanty literature or else from local sources. It is apparent, moreover, that we barely scratched the surface. Village and campsites exist in all parts of the State; they are particularly numerous in the eastern and northeastern sections, but occur also along most or all of the stream valleys westward into the High Plains. Large areas of considerable promise still await professional attention—in the Republican and Smoky Hill drainages, on the Neosho, Verdigris, and Osage Rivers, and in the southern and western areas. All that is required to tap this reservoir of information is a sustained program participated in by nonprofessionals as well as by professionals. The combined efforts of both are needed to expand further the present sketchy framework of human prehistory here and to fill in details.

The results of the survey indicate further an interesting and important variability in remains through time and space, and these serve to document a long story of human endeavor. At the moment, it is undoubtedly true that there are more gaps than continuities in the story, but the outlines are emerging with increasing clarity. Basically, it is a story of several millennia of food-collecting (i. e., hunting-gathering) subsistence economies, followed by several centuries of food producing (i. e., horticulture), with hunting again coming into the ascendancy in the last century or two, but this time with the horse as an important adjunct. So far as there is any evidence at all, the story begins with men who were living, perhaps ten thousand years ago or more, when large game animals of species now extinct roamed the Kansas grasslands and furnished the principal subsistence basis. Later, came the hunters and gatherers of Archaic and of Early Woodland times, about whom we still know almost nothing from the Kansas region. The introduction of horticulture in Woodland times, probably within the Christian Era, and its subsequent intensification gave rise sometime after A. D. 1000 to several semisedentary small-village cultures. From these developed larger communities whose economy rested increasingly on an intensive maize-bean-squash horticulture and whose descendants were, in part, the Village Indians of historic times. In Kansas, as in Nebraska, concentration of the historic tribes—the Kansa, Pawnee, and others—in one or two large villages or towns for each tribe, completed a long sequence of changing settlement patterns. From small camps and loosely arranged rural hamlets, widely scattered and situated on small creeks as often as on the larger rivers, these communities appear to have grown progressively larger in size and fewer in number until they culminated in compact towns, sometimes fortified, of many hundreds of persons residing along the major streams. With these changes, which may safely be inferred from the archeological record, must have come profound shifts in social and political organization, and doubtless in other nonmaterial aspects of life as well. On these points, unfortunately, the archeological record has little to say.

In many respects, the prehistory of Kansas as now seen parallels that of Nebraska. Two notable differences seem to be indicated, however. One is the relatively greater abundance of demonstrable contacts between the prehistoric Kansans and the Pueblo peoples of the upper Rio Grande region. These appear to have been strongest from the 15th century to the 18th. There is much we still need to learn about these contacts, an especially important point being the extent to which they may have involved groups possibly newly arrived in the Southern Plains, such as the Apache. The probability of earlier contacts, which may have left less easily discernible traces, must also be considered. In any case, there is at present no evidence that any marked deflection of Central Plains culture resulted from these interareal relationships. A second point of difference from Nebraska is the stronger southerly orientation of late prehistoric and protohistoric aboriginal culture in Kansas as far north as the great bend of the Arkansas. Whereas the earlier prehistoric remains of Kansas, as in Nebraska, are clearly rooted in the east, influences from the Oklahoma region are certainly present in southern and central Kansas in later times. This matter richly deserves far more attention than it has so far received.

With respect to the relationships of native man in Kansas to the natural environment, there are also interesting leads in the available data. So far as we now know, no part of the State was continuously uninhabitable or unusable to man within the time span of his inferred presence here. The manner in which he utilized the landscape, however, clearly varied from time to time and from section to section. In part, this certainly reflected environmental stresses on his culture; but in part it may also be viewed as an indication of man's growing ability to adapt to varying environmental opportunities and limitations as his cultural equipment improved. The earliest hunters of the Kansas area appear to have been representatives of the western Paleo-Indian tradition; and the discovery of Folsom and Plainview type points in northeastern Kansas suggests that these early groups may have spread, if thinly, over most or all of the State. For them, the inferred abundance of large and small game and of other natural food resources, would have made the entire Kansas area a prime hunting ground. To the later Archaic and Early Woodland hunters and gatherers, the game-rich stream valleys running eastward to the oak-hickory forests of Missouri, would similarly have offered a most inviting hunting ground. Later, with introduction or adoption of maize, the regional differences of climate, soils, and topography became increasingly significant. Settlement during the maize-pottery period was undoubtedly always heaviest in the well-watered stream valleys of eastern Kansas, then as now the most favorable corn-growing sector of the State. There is evidence, however, that the small prehistoric Upper Republican communities, at least, probably spread in northern Kansas far to the westward where, owing to more effective precipitation, the Corn Belt margin bends sharply toward the west. It may be suggested that the tributaries of the Smoky Hill, Solomon, and Saline Rivers would probably reward further search for prehistoric village sites of these early-day corn-growing peoples. Our work in Scott and Lane Counties has direct bearing on this point, for it brought to light suggestions of native maize horticulture far west of the area normally occupied by horticultural peoples in later times.

In Kansas, as in Nebraska, there seems to have been a marked retraction in the territory held by these native food producers before the white man arrived; and by the 16th century, corn-growing Indians were largely restricted in Kansas to the region east of the 99th meridian. The erstwhile Upper Republican range farther west was in the hands of wandering hunters who only later acquired a feeble interest in raising corn. The probability that climatic instability and drought were partly or largely responsible for this retraction of territory has been discussed elsewhere. In any case, the stage was set for the observed historic alinement of Siouan, Algonkian, and other hunting peoples in the western short-grass plains, of semisedentary maize-growing Siouans to the east in the tall grass prairies, and of semihorticultural Caddoans occupying for a time the intermediate mixed-grass area in central Kansas. Further work may show more clearly to what extent the climatic factor, as contrasted to the historical and cultural, was instrumental in bringing about the observed historic groupings. As Kroeber (1939) has observed, "the immediate causes of cultural phenomena are other cultural phenomena." There can be little doubt, however, that a technologically retarded society attempting to subsist in any significant degree on maize growing in the western Plains would have found its economic basis gravely imperiled by the recurrent and often devastating droughts that have probably always been a characteristic of the region.

That further systematic researches in Kansas archeology, properly planned and adequately supported, can be expected to yield fruitful results, is apparent. So, also, is the fact that these can be made to contribute significantly to better understanding of wider anthropological problems in the Plains, particularly through full utilization wherever possible of all relevant ethnohistorical and ethnographic materials. It seems possible that the simpler nature of much of the prehistoric Kansas (and Nebraska) material, as compared to the relatively rich and abundant remains on the Middle Missouri, may reflect the fact that we are dealing here with the earlier antecedents of Plains culture, the initial stages perhaps of man's efforts to develop a food-producing society adapted to the peculiar environment of the Plains region. Manifestly, the geographic location of Kansas has exposed its prehistoric and later inhabitants to cultural influences and ethnic movements from a number of directions and from several highly developed centers of cultural differentiation. There are strong suggestions in the very limited data available of marked physical differences between the bearers of some of the different material culture inventories observed. In the long-range view, of course, consideration must also be given to the environmental variability and to a certain climatic instability that characterize the area. All these considerations lead to the final observation that the region with which this paper has been primarily concerned offers an excellent opportunity to enrich further our understanding of culture growth and change, and of human ecology, in the Great Plains.

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## APPENDIX

# THE FAUNAL LISTS FROM KANSAS

In table 19, I have summarized the occurrence of identified mammal, bird, and molluscan remains, chiefly unworked refuse material, from sites discussed in the present report. The lists must be viewed with caution; they are suggestive rather than definitive. For one thing, the extent of excavation at the several sites varied greatly, so that the base from which the sample is drawn is very uneven. In no instance can it be said that the site represented was more than sampled; and I am certain that more extended excavation would appreciably lengthen the faunal inventories. Moreover, as any student of Plains archeology will immediately realize, the sampling is decidedly one sided with regard to the time factor. Only in Lane County did we obtain identifiable faunal materials from sites or levels that can be termed prehistoric; the Nebraska Culture house sites at Doniphan and the house sites and caches at the Griffing site, all of pre-White age, yielded virtually no bone or shell refuse and none that could be identified.

Despite these deficiencies, it seems to me that the inventories are of some interest. In the first place, the sites from which the materials were collected are scattered throughout the State in such a way as to sample various sections with dissimilar environmental characteristics, varying from the deciduous forests of the east to the short-grass country of the west. These environmental variations include, of course, difference in the biotic assemblages. Moreover, with one exception, the sites represented antedate the year 1800, and thus may throw a little light on faunal distributions and populations prior to the period of white settlement and of large-scale agricultural and commercial development. If it can be reasonably assumed that the Indians, for the most part not yet supplied with horses, drew most heavily upon the fauna near their villages, then the refuse from their hunting and food-gathering activities should reflect the general nature of that fauna at the time of the Indian occupation. Here again any inferences drawn are subject to the limitations of our sampling, as well as to the limitations on our knowledge of the exact nature of hunting methods and butchering techniques during the long period of time preceding the coming of the white man and the horse.

The sites from which identifiable faunal materials were taken have been grouped geographically in table 19. They include three each from the northeastern (Doniphan and Pottawatomie Counties), central (Rice County), south central (Cowley County), and western (Lane and Scott Counties) sections of the State. The northeastern sites are situated in or near heavily timbered river valleys with tall grass prairies nearby. The south-central sites are near the junction of the Walnut and Arkansas Rivers, both with well-timbered valleys, and near the western edge of the oak forest but with easy access to treeless plains in the southern Flint Hills and across the Arkansas to the west. Sites of the central group are in proximity to moderately or sparsely timbered small creek valleys in the mixed prairie and short grass country. The western sites lie well beyond the deciduous forest area of the State, on sparsely timbered creeks hemmed in closely by short grass plains. Some 300 miles separate the Fanning and Doniphan sites of the northeast group from those of the western group; the south central sites are more than 200 miles distant from Doniphan County.

With reference to mammal remains, only two species—bison and white-tailed deer—were represented at all sites. Their relative abundance from east to west, however, varies inversely. Bison bones tend to occur with increasing frequency as the short grass plains are approached, whereas deer bones diminish westward as the forest and brush cover dwindles. As regards these two forms, the indicated east-to-west changes in frequency of occurrence undoubtedly rest in large part, though not exclusively so, on ecological factors. In passing, it may be noted that the 1937 excavations of the U. S. National Museum at the Renner site in Platte County, Mo., situated in the Missouri valley some 40 miles downriver from Doniphan County, Kans., yielded a vastly larger number of deer bones than of bison (Wedel, 1943, p. 27). The unexpectedly high incidence of deer remains at the Scott County site (14SC1) is very likely due to an unusually favorable ecological situation resulting from the convergence within a few miles of the archeological zone of several canyons and deep ravines, originally no doubt with thick brush cover and adjacent to excellent water supplies.

Bones of the dog occur with less frequency; but their absence from certain sites undoubtedly reflects inadequate sampling rather than actual lack of the animal. This is surely the case for the historic Kansa site (14PO24) near Manhattan, where such contemporary observers as Sibley reported the animal in 1811. Absence of dog bones at the Elliott site, despite their presence at two immediately adjacent sites that are apparently chronologically equivalent and culturally similar, can also be explained as inadequate sampling. The

TABLE 19.—*Mammal, bird, and molluscan remains from archeological sites in Kansas*

| Species | Northeastern Kansas | | | South-central Kansas | | | Central Kansas | | | | Western Kansas | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fanning (14DP1) | Doniphan (14DP2) | Kaw Village (14PO24) (Manhattan) | Larcom-Haggard (14CO1) | Elliott (14CO2) | Arkansas City Country Club (14CO3) | Malone (14RC5) | Tobias (14RC8) | Thompson (14RC9) | Site uncertain | Occupation A (Upper Republican) Pottorff (14LA1) | Occupation B (Woodland) | Provenience uncertain | Walter (14LA2) | Scott County State Park (14SC1) |
| *Mammals* | | | | | | | | | | | | | | | |
| Opossum (*Didelphus marsupialis virginiana*) | 1 | 1 | | | | | | | | | | | | | |
| Jackrabbit, white-tailed, (*Lepus townsendii campanius*) | 1 | | | | | | | | | | | | | | |
| Jackrabbit, black-tailed (*Lepus californicus melanotis*) | 1 | | | | | | | | 1 | | 2 | 3 | | 2 | |
| Jackrabbit (*Lepus* sp.) | | | | | | | | | | | | | | | 1 |
| Rabbit, cottontail (*Sylvilagus floridanus*) | | | | 12 | | | | | | | | 5 | | | |
| Woodchuck (*Marmota monax bunkeri*) | 1 | 1 | | | | | | | | | | | | | |
| Prairie dog (*Cynomys ludovicianus*) | | | | | | | | 4 | | | 17 | 25 | | 4 | 12 |
| Ground squirrel (*Citellus tridecemlineatus*) | | | | | 1 | 1 | | 2 | | | | | | | |
| Pocket gopher (*Thomomys talpoides*) | | | | | | | | | | | | | | | 2 |
| Pocket gopher (*Geomys bursarius*) | 6 | | 1 | | 2 | | 1 | | | | | | | | |
| Kangaroo rat (*Dipodomys ordii richardsoni*) | | | | | | | 1 | 3 | | | | | | | 1 |
| Beaver (*Castor canadensis missouriensis*) | 10 | 11 | 1 | | | | | | | | | | | | |
| Wood rat (*Neotoma* cf. *floridana*) | | | | | | | | | | | 1 | | | | 5 |
| Coyote (*Canis latrans*) | | | | | | | | | | | 11 | 10 | | | |
| Wolf (*Canis lupus*) | | | | | | | | | 1 | | 25 | 1 | 2 | | |
| Dog (*Canis familiaris*) | 18 | 6 | | 56 | | 1 | 13 | 29 | 9 | 1 | | 1 | 1 | | 12 |
| Dog or coyote | | | | | | | | | | | | | 5 | | 6 |
| Dog or wolf | 10 | | | | | | | 1 | 2 | | | | | | |
| Kit fox (*Vulpes velox*) | | | | | | | | | | | 3 | 1 | | | 3 |
| Black bear (*Euarctos americanus*) | 7 | 22 | 2 | | | | | | | | | | | | |
| Raccoon (*Procyon lotor*) | 8 | 2 | 1 | | | 1 | 1 | | | | 2 | | | | 4 |
| Badger (*Taxidea taxus*) | | | | | | | | 2 | | | 1 | | | | 2 |
| Striped skunk (*Mephitis mephitis*) | | 1 | | | | | | | | | 2 | | | 1 | |
| Puma (*Felis concolor*) | 1 | | 1 | | | | | | | | | | | | |
| Wild cat (*Lynx rufus*) | 1 | | | | | | | | | | | | | | |
| Elk (*Cervus canadensis*) | 5 | 8 | | | 3 | 1 | | | 1 | | | | | | |
| Deer, white-tailed (*Odocoileus virginianus*) | 120 | 74 | 18 | 17 | 6 | 4 | 8 | 18 | 6 | 1 | 3 | 9 | | 1 | 32 |
| Antelope (*Antilocapra americana*) | | | | | | | | 11 | 2 | | 1 | 16 | | 1 | |
| Bison (*Bison bison*) | 29 | 6 | 1 | 44 | 29 | 10 | 18 | 59 | 26 | 9 | 150 | 7 | 16 | 14 | 65 |
| Horse (*Equus caballus*) | | 1 | 2 | | | | | | | | | | | | |
| *Birds* | | | | | | | | | | | | | | | |
| Grebe, pied billed (*Podilymbus podiceps*) | | | | | | | | 1 | | | | | | | |
| Heron, great blue (*Ardea herodias*) | | | | | | | | 2 | | | | | | | |
| Duck, black (*Anas rubripes*) | | | | 1 | | | | 1 | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Teal, blue-winged (*Anas discors*) | | | | | | | | | | | | 1 | | | |
| Merganser, hooded (*Lophodytes cucullatus*) | | | | | | | | 1 | | | | | | | |
| Hawk, red tailed (*Buteo jamaicensis*) | | | | | | | | | | | | 1 | | | |
| Hawk, red shouldered (*Buteo lineatus*) | 1 | | | | | | | | | | | | | | |
| Hawk, Swainson's (*Buteo swainsoni*) | | | | | | | | | | | ? | ? | 1 | | |
| Hawk, ferruginous rough-legged (*Buteo regalis*) | | | | | | | | | | | | | | | 1 |
| Eagle, golden (*Aquila chrysaetos*) | | | | | | | | | | | | 1 | | | |
| Eagle, bald (*Haliacetus leucocephalus*) | | | | 1 | | | | | | | | | | | |
| Falcon, prairie (*Falco mexicanus*) | | | | | | | | | | | | | | | 1 |
| Grouse, ruffed (*Bonasa umbellus*) | | | | | | | | | | | 1 | | | | |
| Quail, bobwhite (*Colimus virginianus*) | | | | | | | | 1 | | | | | | | |
| Turkey (*Meleagris gallopavo*) | 4 | 1 | 2 | 2 | 2 | 1 | | | | | | | | | |
| Crane, whooping (*Grus americana*) | | | | | | | | | | | | | | | 1 |
| Coot (*Fulica americana*) | | | | | | | | | | | | | | | 1 |
| Owl, great horned (*Bubo virginianus*) | | | | | | | | 1 | | | | | | | 1 |
| Raven (*Corvus corax sinuatus*) | | | | | | | | 1 | | | | | | | |
| Crow, American (*Corvus brachyrhynchos*) | | | | | 12 | | | 1 | | | | | | | |
| *Mollusca* | | | | | | | | | | | | | | | |
| Gastropoda: | | | | | | | | | | | | | | | |
| *Bulimulus dealbatus* | | | | | | | | | × | | | | | | |
| *Succinea grosvenori* (Lea) | | | | | | | | | | | × | | | | |
| *Physella hawni* (Lea) | | | | | | | | | | | × | | | | |
| *Helisoma anceps* (Menke) | | | | | | | | | | | × | | | | |
| *Helisoma trivolvis* (Say) | | | | | | | | | | | × | | | | |
| Pelecypoda: | | | | | | | | | | | | | | | |
| *Fusconia flava* Raf | | | × | | | | | | | | | | | | |
| *Amblema costata* Raf | × | | × | × | × | | | | | | | | | | |
| *Quadrula quadrula* Raf | × | | | × | × | | × | × | | | | | | | |
| *Quadrula pustulosa* (Lea) | | | | × | × | | × | × | | | | | | | |
| *Quadrula pustulosa prasina* (Conrad) | × | | × | | × | | × | × | × | | × | | | | |
| *Tritigonia verrucosa* (Raf) | × | | | × | × | | | | | | | | | | |
| *Pleurobema coccineum* Conrad | × | | | | × | | | × | | | × | × | | | |
| *Pleurobema coccineum solida* Lea | | | × | | | | | | | | | | | | |
| *Elliptio dilatatus* (Raf) | | | | | | | | × | | | | | | | |
| *Uniomerus tetralasmus* (Say) | | | | × | | | × | × | × | | × | | | | |
| *Lasmigona complanata* (Barnes) | | | | × | × | | × | | | | × | | | | |
| *Anodonta grandis* Say | | | | | | | × | | | | | | | | |
| *Strophitus rugosus* (Swainson) | | | | | | | × | × | × | | | | | | |
| *Obliquaria reflexa* (Raf) | | | | × | × | | | | | | | | | | |
| *Obovaria olivaria* Raf | | | × | | | | | | | | | | | | |
| *Truncilla truncata* Raf | | | | | × | | | | | | | | | | |
| *Potamilus alatus megapterus* (Raf) | | × | | | × | | | × | | | | | | | |
| *Potamilus laevissimus* (Lea) | | | × | | | | | | | | | | | | |
| *Potamilus purpuratus* (Lamarck) | × | | | | | | | | | | | | | | |
| *Potamilus capax* (Green) | | | | × | | | | | | | | | | | |
| *Carunculina parva* (Barnes) | | | | | | | × | | | | | | | | |
| *Ligumia recta latissima* (Raf) | | × | | | | | | | | | | | | | |
| *Ligumia subrostrata* (Say) | | | | | | | × | × | | | × | × | | | |
| *Lampsilis anodontoides* (Lea) | | | | × | × | | × | | × | | | | | | |
| *Lampsilis fallaciosa* (Smith | × | | | | | | | | | | | | | | |
| *Lampsilis siliquoidea* (Barnes) | × | × | | | | | | | | | | | | | |
| *Lampsilis ventricosa occidens* (Lea) | × | | × | | | | | × | | | | | | | |
| *Sphaerium sulcatum* (Lamarck) | | | | | | | | | | | × | | | | |

dog bones await full treatment by a qualified observer; but it may be noted that among the remains large animals are indicated for practically all of the central, south central, and western sites. This suggests the possibility of large draft animals perhaps developed in late prehistoric times for purposes that were later accomplished by the horse, that is, the transport of baggage and other burdens.

Otherwise, the assemblages indicated in table 19 conform pretty much to what might be expected, except that there are a number of absences most readily explained in terms of incomplete sampling. The black bear, puma, beaver, wildcat, and woodchuck are recorded only for the northeastern sites. They reflect the presence of heavy timber and brush cover; all are woodland species, though their distribution in the State was undoubtedly much wider than our scanty evidence indicates. Antelope, wolf, badger, and prairie dog were found by us only in the central and western sites; the coyote, kit fox, and wood rat only in the western sites. Elk bones were recovered from the northeastern, central, and south-central sites, at all of which some open woods and adjacent grasslands were to be found. Raccoon bones occurred in sites in all sections. The occurrence of the opossum is of interest; it was represented in two sites at the edge of the Missouri valley in the extreme northeast. Both occurrences are from Indian villages of the early contact period (pre-1750); and they suggest that the animal may have been just beginning its spread from the eastern woodlands into the trans-Missouri plains.

Bird bones occurred so infrequently and scatteringly as to be of little usefulness. It is of some interest, however, to note that the wild turkey is represented only in the northeastern and south-central sites—in other words, in and at the margin of the oak forests of eastern Kansas. Actually, the turkey ranged much further westward along the timbered stream valleys; and it would be rather surprising if future excavation failed to disclose its remains at sites in our central group and to the north.

So far as this evidence goes, it suggests that environmental conditions during the period represented by our sites were essentially like those of the recent past, say after 1800. The earlier Indian populations with which our investigations were primarily concerned generally pursued a semihorticultural subsistence economy, supplementing their domestic crops with such animal and other foods as they were able to get in the vicinity of their settlements. In the eastern part of the State, the abundant fauna of the forested valleys was constantly drawn upon; and this was augmented from time to time by bison, killed either in the nearby prairies or in course of longer hunting excursions to the west. The residents of the central, south central, and western sections presumably drew much more regularly on the bison, in and near whose range their settlements were located; and to this were added such items as deer and other smaller mammals as the limited timber of the stream valleys offered.

It has already been indicated that only the Lane County data in table 19 relate to pre-White sites. They are of added interest because they suggest a phenomenon that has been noted in other Central Plains localities. As the table shows, the later occupation here, attributed to the Upper Republican culture, shows a much higher proportion of bison to other animal bone than does the earlier Woodland occupation. Conversely, the Woodland level yielded much more antelope, and more deer, prairie dog, and rabbit than did the Upper Republican horizon, despite the fact that our tests included an appreciably smaller proportion of the Woodland zone than of the Upper Republican. The data seem to hint at a greater reliance on smaller mammals by the Woodland peoples and, conversely, a greater emphasis on bison by the later Upper Republican peoples. Similar differences between Woodland faunal assemblages and those from later archeological horizons have been noted in Nebraska, especially on Medicine Creek in Frontier County and at the Kelso site in Hooker County (Kivett, 1949, p. 283; 1952, p. 39). The recurring indications in widely separate localities that small mammals, birds, and other lesser animals are relatively more plentiful than bison in Woodland sites, and that this situation is reversed in later manifestations in the same localities, poses an interesting problem.

The solution to this problem is not immediately apparent. It is easy to suggest that differences in hunting methods or butchering techniques may be responsible, but this is not enough. In what way did they differ? At the Pottorff site in Lane County, both Upper Republican and Woodland peoples lived on the same creek terrace, separated only by an interval of time whose length is unknown; both had equal access to thinly wooded creek bottoms and to nearby grasslands; both hunted on foot; both transported their kill on their own backs or on dogs. Here, as at the Nebraska localities specified, only foot hunters are involved; and I see no reason to suppose that the later peoples, whether of Upper Republican or of Dismal River culture, would have been any more likely than the earlier Woodland hunters to carry back to camp any appreciable quantities of useless bison bone. Why, then, the indicated differences in the animal inventory as shown by the refuse bone?

Several possible explanations may be suggested. One which impresses me as rather remote is that the bison were for some reason less plentiful in Woodland times than later, and thus furnished a much less dependable food source. Another is that the western Woodland sites in which most of our work has been carried on to date represent mainly winter camps, situated in sheltered stream valleys, where bison were less easily obtained than were deer and other small game animals and birds associated with brush or tree cover. Again, it is possible the Woodland peoples actually preferred small game to bison; but I strongly doubt that any Indian group would live long in proximity to the bison herds without realizing, and taking advantage of the fact, that here was a vastly more rewarding quarry for the hunter than a deer, an antelope, or a rabbit. On the other hand, the latter could be more easily secured by individual effort than could the bison, which are most effectively taken by organized communal drives. Archeological evidence suggests that the Woodland populations, especially in the western and possibly earlier variants, were small, scattered, and unsettled; and it may be that for such groups effective large-scale bison drives could not be mounted as successfully or as frequently as among the later and more populous groups.

My convictions on this matter are not particularly strong at present. If, however, future work bears out the indicated faunal differences we have just discussed, I suggest that the likeliest explanation may lie in the sparse and unstable nature of the Woodland occupations as compared to later semihorticultural manifestations of the region; that the small communities of this period probably found it less profitable to pursue the bison; and that their bone refuse reflects a subsistence economy based primarily on creek-bottom hunting and gathering, and perhaps only slightly above the foraging level.

# DESCRIPTION OF THE SKELETAL REMAINS FROM DONIPHAN AND SCOTT COUNTIES, KANSAS

By T. D. Stewart

Two lots of material will be described: (1) The remains of 10 burials collected by Dr. Wedel in the summer of 1937 at the Doniphan site, and (2) the remains of 3 burials collected by Dr. Wedel in the summer of 1939 at the Young site in Scott County. The former dates from historic times and probably represents the Kansa tribe; the latter seems to represent the prehistoric people of the Early Woodland culture. As will be shown, the skulls of these two lots offer a decided contrast in shape, those of the Kansa being artificially deformed and hence quite round, and those of the Woodland people being extremely long and narrow.

## I. DONIPHAN SITE

The skeletal remains recovered at this site consist of 7 subadults and 5 adults (3 males, 1 female, and 1 female?). The skeletons are well preserved but vary considerably in completeness, owing apparently to the action of burrowing animals, to farming activities, and to the curiosity of man in recent times. Detailed measurements of the adults are assembled in tables 1 to 4. Otherwise each specimen is considered separately in the order of the burial numbers, and the group is discussed on p. 679.

*Burial No. 1* (*USNM No. 378811*).—Child about 8 years of age. Lacks mainly the leg bones, left ulna, pubes, ischia, hands and feet, a few cervical vertebrae, and most of the lumbar and sacral vertebrae.

The skull shows asymmetrical occipital compression (more on left than right) with a resultant cranial index of 98.7. Eruption of the permanent teeth has advanced to the stage where the first molars and all of the incisors have reached the occlusal plane, but the second molars and the canines have not yet emerged from the alveoli. The cusps of the deciduous first molars are worn down so that the dentin is exposed; those of the deciduous second molars are not worn down so far.

The base of the skull and the bones of the upper arms, shoulders, and chest are stained green by copper salts.

*Burial No. 2* (*USNM No. 378812*).—Child about 8 years of age. Skull damaged. Skeleton lacks mainly the radii, left ulna, fibulae, pubes, ischia, hand and foot bones, and several vertebrae.

The skull shows asymmetrical occipital compression (more on left than right) with a resultant cranial index close to 91.5. Tooth eruption is in the same stage as in No. 1. However, wear of the deciduous molars is a little more advanced.

Some of the long bones have been gnawed by animals. In addition, the anterior midshafts of the tibiae, especially the left, show an early stage of periostitis with slight diffuse swelling. Another such area occurs in the right ulna along the whole posterior surface of the shaft. The nature of these inflammatory processes is unknown.

*Burial No. 3* (*USNM No. 378813*).—Adult female (?). In many respects this is an intermediate case from the standpoint of sex identification. Size suggests a female, but some of the sex characters of the pelvis suggest a male. All of the bones are present except the right radius, right clavicle, part of the sacrum, and a few ribs, vertebrae, hand and foot bones. Most of the bones present have been gnawed by animals, but particularly the borders of the nose and orbits, the coronoid processes of the mandible, and certain prominent ridges on the long bones. The occiput of the skull has been slightly more compressed on the right than on the left (pl. 94).

In considering age, the symphyseal surface of the pubis appears to have begun to break down after having reached a complete plateau with rim. Probably this means an age of 40+ years. In keeping with this age is the advanced ectocranial closure of the main vault sutures, including the inferior portion of the masto-occipital suture. Also, the molar teeth were being lost at the time of death and the remaining teeth are moderately worn. On the other hand, osteophytosis (lipping of the borders of the vertebral bodies) does not exceed 2+ (on a 4+ scale).

A pathological process appears on the anterior border of the left tibia at midshaft and consists of a small area of swelling and altered surface texture. Probably this is healed periostitis following trauma.

Among the anomalies present are the following: A small paraoccipital process on the left side of the foramen magnum; a small third trochanter on each femur. It should be noted also that the humeri lack septal apertures.

*Burial No. 4* (*USNM No. 378814*).—Adult male. Consists mainly of the left humerus, right ulna, femora, tibiae, innominates, sacrum, 13 vertebrae, and some small bones. Animals have gnawed the zygomatic processes, right orbit, and the shafts of the left humerus, right ulna, right tibia, and right fibula. The occiput of the skull has been slightly more compressed on the right than on the left (pl. 95).

The symphyseal face of the pubis has reached a plateau, but the rim is incompletely formed. This stage probably represents an age around 35 years. Ectocranial closure of the vault sutures, which is advanced in the region of bregma, but nowhere else, supports this determination. Also, tooth wear is only second degree, and vertebral osteophytosis is limited to three lumbar segments (2+).

No pathological changes were noted. Large third trochanters are present on the femora. The humeri lack septal apertures.

*Burial No. 5* (*USNM No. 378815*).—Adult male. The lower jaw is present but not the skull. Although some of the postcranial bones are damaged, very few are missing, namely, the left clavicle and first two cervical vertebrae. Green stains appear on the forearm and pelvic bones.

An age of 30–35 years is indicated by the symphyseal surface of the pubis which has reached the plateau stage but retains traces of billowing and still lacks a rim. Other indicators of age are: Second-degree wear of the teeth of the mandible; beginning (1+) vertebral osteophytosis limited to two points in the spine.

No pathological changes were noted. There is an extra malformed right lower incisor between and behind $I_1$ and $I_2$. A moderate-sized third trochanter is present on the left femur; a small one is present on the right. The humeri lack septal apertures.

*Burial No. 6* (*USNM No. 378816*).—Child. Partial skull only (no face). In size this specimen is comparable to No. 2, hence probably it is about the same age. There is no asymmetry of the vault, and the cranial index is 93.3.

*Burial No. 7* (*USNM No. 378817*).—Child about 8 years of age. The lower jaw is present but not the skull. The postcranial skeleton lacks the right radius, clavicles, left femur, left tibia, fibulae, left pubis, left ischium, some ribs, some vertebrae, and the hand and foot bones. All of the bones except the vertebrae are stained green. Some of the long bones have been gnawed by animals.

The age is shown by the eruption of the permanent lower first molars and incisors which have reached the occlusal plane. All other mandibular permanent teeth are still deep in the alveoli.

*Burial No. 8* (*USNM No. 378818*).—Male between 15 and 20 years of age. The specimen consists of a few pieces of skull, the lower jaw, 5 incomplete long bones, damaged innominates and sacrum, and two lumbar vertebrae. Unfortunately the parts most critical for ageing are not present. However, it appears that the elbow and hip epiphyses are united, the crest of the ilium is ununited, S1 and S2 vertebrae are incompletely united, and the epiphyses of the lumbar centra are incompletely united. Also, the third molars are not erupted. Some of the long bones have been gnawed by animals. The left side of the mandible shows green stain.

*Burial No. 10* (*USNM No. 378819*).—Adult male. Lacks mainly the left radius, left ulna, left tibia, fibulae, sternum, some ribs and vertebrae, and most of the hand and foot bones. Animal tooth marks are limited to the foramen magnum of the skull, the right ulna, and the pelvic bones. The occiput of the skull has been very slightly more compressed on the left than on the right (pl. 96).

The symphyseal surface of the pubis has reached a plateau but is still lacking a rim. This stage, which probably corresponds to an age of 30–35 years, is consistent with the amount of tooth wear and ectocranial suture closure present: second degree wear and closure of the coronal and sagittal sutures chiefly around bregma. Beginning osteophytosis appears in the upper thoracic vertebrae.

No pathological changes were noted. A small third trochanter is present in each femur. Septal apertures are not present in the humeri.

*Burial No. 11* (*USNM No. 378820*).—Adult female. Although some bones are damaged, only a few parts are missing: left clavicle, sternum, and various smaller bones. All of the bones present are free from animal tooth marks. The occiput has been symmetrically compressed (pl. 97).

As so often in Indian women of middle age, the symphyseal surface of the pubis is distorted (Stewart, 1957). On the other hand, the teeth are moderately worn and ectocranial suture closure is advanced in the region of bregma. Osteophytosis is general throughout the vertebral column, but still not above 2+ at any point. All of this suggests an age of 35+ years. It is noteworthy also that large interproximal caries are present in the upper right second and third molars. Less advanced interproximal caries are present in some of the other teeth.

Death may have been due to a penetrating wound in the posterior medial angle of the left parietal. In contrast to the sharply defined external opening, which is rectangular (15×3 mm.), the internal opening is craterlike, due to the flaking of the internal table over a circular area 2.4 to 2.7 cm. in diameter. The area of breakage lacks the fresh look which characterizes damage made in the process of excavation. A second small wound (5×3 mm.), obviously made by the point of the same instrument, is located just medial to the left parietal boss. Here penetration is through the external table into the diploë. In each case the shape of the external opening and straightness of the edges of the opening suggest a metal instrument.

No pathological processes were seen. The fifth lumbar vertebra has an arch defect through the pars interarticularis on the right side; on the left the arch is intact but the articular facets are distorted by marginal lipping. A small third trochanter is present in the left femur; none is present on the right. Pinpoint-sized septal apertures are present in both humeri.

## II. YOUNG SITE

Three burials, one including at least two individuals, were recovered from this early site in Scott County. All individuals appear to be adult females. In contrast to the good state of preservation of the bones from the Doniphan site, those from the Young site are very fragile. Only one skeleton, No. 3, approaches completeness. Whatever measurements could be taken are assembled in tables 1 to 4. The relationships of this group are discussed on page 680.

*Burial No. 1 (USNM No. 379758)*.—At least two adult females. The following parts are present: Right mastoid process, 2 upper jaws, left half of a lower jaw, 6 loose teeth, 2 small rib fragments, distal end of a left humerus, a right femur lacking distal end, and part of a right innominate. The sciatic notch of the innominate and the linea aspera of the femur have been gnawed by animals.

If one of the upper jaws belongs with the lower jaw—and this is uncertain—at least two individuals are represented. Judging from the innominate, one is a female; judging from the size of the jaws, both are females. The sizes of the other bones are consistent with this interpretation.

All of the teeth present show extreme wear. In addition the sacroiliac joint shows degenerative changes, probably due to childbearing. Thus both individuals are adult and perhaps in middle age.

The parts present are not complete enough for measuring. The femur lacks a third trochanter. The humerus lacks a septal aperture.

*Burial No. 3 (USNM No. 379759)*.—Adult female. The following parts are present: Nearly complete skull and lower jaw (fig. 107); C2–3, 5–7, T1 vertebrae; part of the right scapula; distal part of the left clavicle; pair of humeri (head of left damaged); pair of radii (proximal end of left damaged); pair of ulnae (distal end of right damaged); left second and third metacarpals; a phalanx from the left hand; pair of innominates (right more complete than left); pair of femora; pair of tibiae (right damaged at both ends); pair of fibulae (distal end of right and proximal end of left damaged); the right talus; and the right calcaneus.

In the absence of the pubes, age must be stated in general terms on the basis of tooth wear, suture closure, and joint changes. Tooth wear is moderate, but suture closure is minimal and joint lipping is not evident. The age, therefore, is probably around 25–30 years.

The only pathological changes seen are in the leg bones. The lower half of the right fibula exhibits some roughness on the lateral surfaces. An extension of this condition appears on the posterior medial border of the right tibia in the middle third. Probably such localized roughness represents healed periostitis from an old injury.

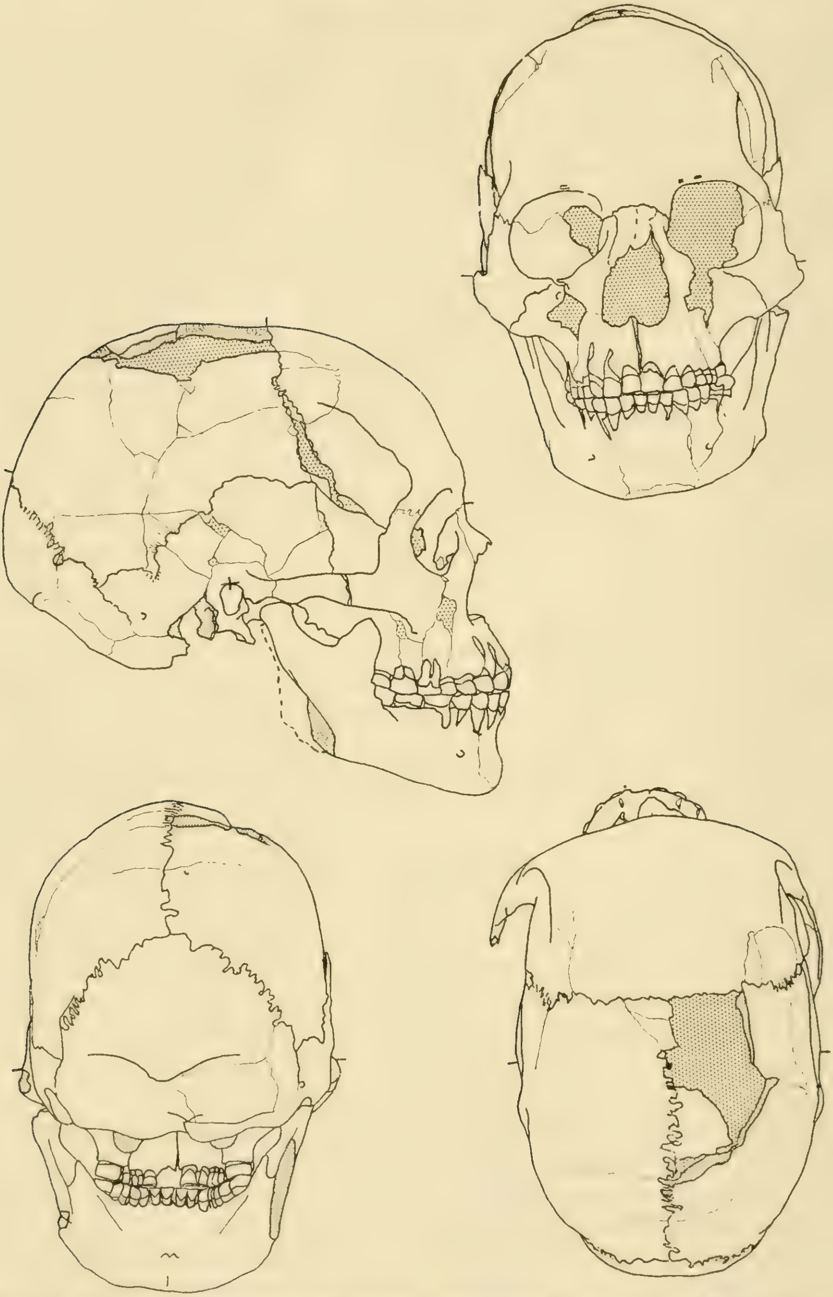

FIGURE 107.—Four stereographic views of the Young site skull No. 3 (USNM No. 379759), a young adult female. Note the hyperdolichocrany (63.4) and the suggestion of Negroid appearance in the face.

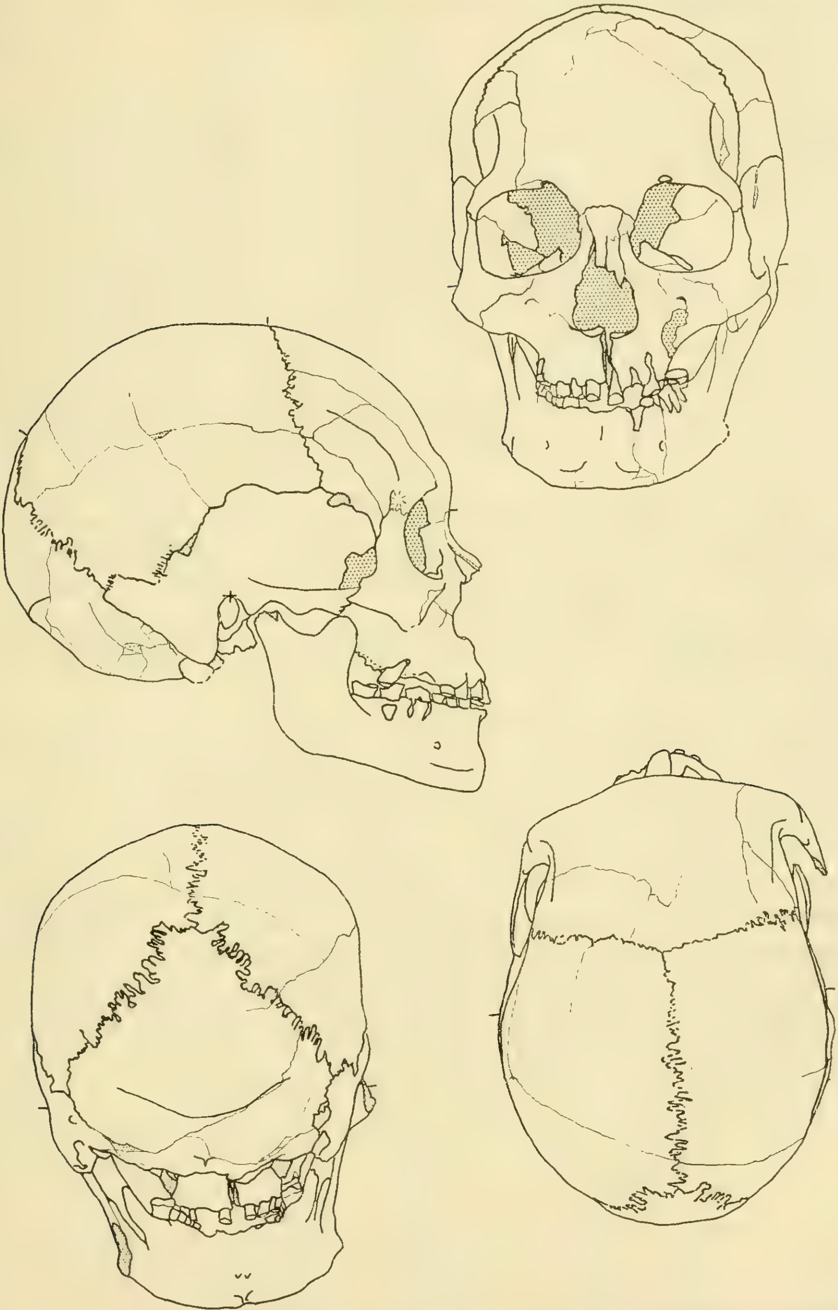

FIGURE 108.—Four stereographic views of the Young site skull No. 5 (USNM No. 379760), a female around 40 years of age. Note the dolichocrany (73.0).

The femora lack third trochanters and the humeri lack septal apertures.

*Burial No. 5 (USNM No. 379760).*—Adult female. The following parts are present: Nearly complete skull and lower jaw (fig. 108), C1 and 2 vertebrae, a right humerus (proximal end missing), a right radius and ulna fused at the proximal end (distal end of ulna missing), an accessory bone (?) perhaps related to the pathological fusion of the radius and ulna, 3 phalanges of the fingers, left innominate (damaged), pair of femora (extremities damaged), distal end of the left tibia, the left metatarsal, and 2 phalanges of the toes.

The circumarticular area of the ilium has female characters. This identification is supported by most of the sex characters of the skull, although the supraorbital ridges are above average in prominence for a female and the superior orbital margins are rounded as in most males.

Age determination in this case, as in No. 3, depends largely on tooth wear, suture closure, and joint changes. Tooth wear is extreme and endocranial suture closure is complete; but ectocranially the sutures are mostly still visible. In addition, the facet for the dens on C1 is markedly lipped. All of this suggests an age of not less than 40 and perhaps above 40.

An old injury has led to the fusion of the right radius and ulna just below the elbow joint. The resulting position of the radius and hand is mid-pronation. Flexion of the elbow appears not to have been affected, although on the humerus the joint surface is roughened and the joint margins are lipped. A loose nodule of bone (13×11×6 mm.) was found in the vicinity of the head of the radius. Since the latter has suffered postmortem damage, the nature of the original injury, whether fracture or infection, and the explanation of the bone nodule, are not clear. Also, the middle third of the shaft of the ulna appears to be more slender than usual. Perhaps, therefore, some bone atrophy has occurred in this area.

TABLE 1.—*Kansas crania: Individual measurements (mm.) and indices by site and sex*

| Site | Burial No. | USNM No. | Diam. ant.-post. max. | Diam. lat. max. | Bas.-breg. ht. | Bipor.-breg. ht. | Cranial index | Mean ht. index | Mean ht. index (aur.) | Cranial module | Cranial capacity (cc) | Fr. chord | Diam. fr. min. | Fr. index | Menton-nasion ht. | Alv. pt.-nas. ht. | Diam. biz. max. | Fac. index, total | Fac. index, upper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | MALE | | | | | | | | | | |
| Doniphan | 4 | 378814 | 180 | 156 | 132 | 115 | 86.7 | 78.6 | 68.4 | 156 | 1,500 | 110 | 92 | 83.6 | 129 | 80 | 151 | 85.4 | 53.0 |
| Do | 10 | 378819 | 170 | 145 | 132 | 115 | 85.3 | 83.8 | 73.0 | 149 | 1,350 | 109 | 85 | 78.0 | 114 | 74 | 143 | 79.7 | 51.7 |
| | | | | | | | | | FEMALE | | | | | | | | | | |
| Do | 3 | 378813 | 173 | 136 | 130 | 116 | 78.6 | 84.1 | 75.1 | 146 | 1,300 | 106 | 87 | 82.1 | 109 | 69 | 132 | 82.6 | 52.3 |
| Do | 11 | 378320 | 168 | 148 | 130 | 113 | 88.1 | 82.3 | 71.5 | 149 | 1,320 | 109 | 91 | 83.5 | 116 | 75 | 141 | 82.3 | 53.2 |
| Young | 3 | 379759 | 183 | 116 | 123 | 104? | 63.4 | 82.3 | 69.6? | 141 | -------- | 104 | 93 | 89.4 | 115 | 67 | 134 | 85.8 | 50.0 |
| Do | 5 | 379760 | 178 | 130 | 130 | 108 | 73.0 | 84.4 | 70.1 | 146 | -------- | 103 | 86 | 83.5 | 112 | 71 | ------ | ------ | ------ |

| Site | Burial No. | USNM No. | Endobas.-nas. | Endobas.-sub. nas. pt. | Endobas.-prealv. pt. | Facial angle (Deg.) | Alveol. angle (Deg.) | Orb. ht., mean | Orb. br., mean | Orb. index, mean | Nasal ht. | Nasal br. | Nasal index | Ext. alv. lt. | Ext. alv. br. | Ext. alv. index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MALE | | | | | | | | |
| Doniphan | 4 | 378814 | 106 | 92 | 103 | 69.5 | 59.5 | 34 | 40.5 | 84.0 | 50 | 25 | 50.0 | 66 | 59 | 111.9 |
| Do | 10 | 378819 | 106 | 92 | 100 | 73.0 | 61.0 | 33.5 | 37.5 | 89.3 | 54 | 27 | 50.0 | 68 | 53 | 128.3 |
| | | | | | | | | FEMALE | | | | | | | | |
| Do | 3 | 378813 | 95 | 87 | 97 | 67.5 | 59.5 | 32? | 37? | 86.5? | 45 | 28? | 62.2? | 60 | 53 | 113.2 |
| Do | 11 | 378820 | 96 | 86 | 98 | 66.0 | 54.0 | 33.5 | 39 | 85.9 | 51 | 28 | 54.9 | 64 | 56 | 114.3 |
| Young | 3 | 379759 | 110 | 99 | 113 | 70.0 | 47.0 | 33 | 38 | 86.8 | 47 | 26 | 55.3 | 59 | 62 | 105.1 |
| Do | 5 | 379760 | 107 | 93? | 106? | 71.5? | 51.0? | 33.5 | 40? | 83.8? | 49.5 | 24? | 48.5? | -------- | -------- | -------- |

TABLE 2.—*Kansas femora: Individual measurements (mm.) and indices by site, side and sex*

| Site | Burial No. | USNM No. | Max. lt. | Bicond. lt. | Diam. a.-p. at middle | Diam. lat. at middle | Index of shaft | Diam. max. u. flat | Diam. min. u. flat | Platymeric index |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MALE, RIGHT | | | | | |
| Doniphan | 4 | 378814 | 461 | 458 | 31 | 29 | *93.5* | 37 | 26 | *70.3* |
| Do | 5 | 378815 | 430 | 425 | 29 | 26 | *89.6* | 34 | 23 | *67.6* |
| Do | 10 | 378819 | 450 | 448 | 30 | 29 | *96.7* | 36 | 26 | *72.2* |
| | | | | | MALE, LEFT | | | | | |
| Do | 4 | 378814 | 465 | 462 | 32 | 30 | *93.8* | 38 | 27 | *71.0* |
| Do | 5 | 378815 | 441 | 436 | 28 | 27 | *96.4* | 35 | 24 | *68.6* |
| Do | 10 | 378819 | 447 | 445 | 29 | 29 | *100.0* | 36 | 25 | *69.4* |
| | | | | | FEMALE, RIGHT | | | | | |
| Do | 3 | 378813 | 395 | 388 | 26 | 24 | *92.3* | 29 | 22 | *75.9* |
| Do | 11 | 378820 | 424 | 415 | 25 | 23 | *92.0* | 32 | 22 | *68.8* |
| Young | 3 | 379759 | 391 | 387 | 25 | 23 | *92.0* | 29 | 20 | *69.0* |
| | | | | | FEMALE, LEFT | | | | | |
| Doniphan | 3 | 378813 | 402 | 401 | 27 | 27 | *100.0* | 31 | 22 | *71.0* |
| Do | 11 | 378820 | 425 | 420 | 26 | 27 | *103.8* | 32 | 23 | *71.9* |
| Young | 3 | 379759 | 396 | 392 | 26 | 24 | *92.3* | 30 | 20 | *66.7* |

TABLE 3.—*Kansas tibiae and humeri: Individual measurements (mm.) and indices by site, side, and sex*

| Site | Tibia | | | | | | Humerus | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Burial No. | USNM No. | Med. condyle-malcolus lt. | Diam. a.-p. at middle | Diam. lat. at middle | Index of shaft | Max. lt. | Diam. max. at middle | Diam. min. at middle | Index of shaft |
| | | | | | MALE, RIGHT | | | | | |
| Doniphan | 4 | 378814 | 385 | ------ | 25 | ------ | ------ | ------ | ------ | ------ |
| Do | 5 | 378815 | 385 | 33 | 21 | *63.6* | 313 | 26 | 15 | *57.7* |
| Do | 10 | 378819 | 373 | 32 | 23 | *71.9* | 316 | 25 | 17 | *68.0* |
| | | | | | MALE, LEFT | | | | | |
| Do | 4 | 378814 | 382 | 35 | 24 | *68.6* | ------ | ------ | ------ | ------ |
| Do | 5 | 378815 | 389 | 33 | 21 | *63.6* | 314 | 25 | 15 | *60.0* |
| Do | 10 | 378819 | ------ | ------ | ------ | ------ | 311 | 25 | 16 | *64.0* |
| | | | | | FEMALE, RIGHT | | | | | |
| Do | 3 | 378813 | 313 | 25 | 19 | *76.0* | 288 | 20 | 15 | *75.0* |
| Do | 11 | 378820 | 345 | 26 | 20 | *76.9* | 299 | 23 | 14 | *60.9* |
| Young | 3 | 379759 | ------ | 25 | 17 | *68.0* | 289 | 22 | 13 | *59.1* |
| | | | | | FEMALE, LEFT | | | | | |
| Doniphan | 3 | 378813 | ------ | 28 | 18 | *64.3* | 279 | 20 | 15 | *75.0* |
| Do | 11 | 378820 | 345 | 25 | 20 | *80.0* | 292 | 23 | 15 | *65.2* |
| Young | 3 | 379759 | 336 | 25 | 17 | *68.0* | ------ | 20 | 13 | *65.0* |

TABLE 4.—*Kansas long bones: Measurements (mm.) by site, side, and sex*

| Site | Burial No. | USNM No. | Max. lt. of radius | Max. lt. of ulna | Max. lt. of clavicle | Max. lt. of fibula |
|---|---|---|---|---|---|---|
| | | | MALE, RIGHT | | | |
| Doniphan | 4 | 378814 | ---------- | 277 | ---------- | ---------- |
| Do | 5 | 378815 | 254 | 281 | 165 | ---------- |
| Do | 10 | 378819 | 249 | 271 | 166 | ---------- |
| | | | MALE, LEFT | | | |
| Do | 4 | 378814 | ---------- | ---------- | ---------- | ---------- |
| Do | 5 | 378815 | ---------- | 283 | ---------- | 386 |
| Do | 10 | 378819 | ---------- | ---------- | 162 | ---------- |
| | | | FEMALE, RIGHT | | | |
| Do | 3 | 378813 | ---------- | 237 | ---------- | 311 |
| Do | 11 | 378820 | 225 | 245 | ---------- | 344 |
| Young | 3 | 379759 | 227 | ---------- | ---------- | ---------- |
| | | | FEMALE, LEFT | | | |
| Doniphan | 3 | 378813 | 213 | 234 | 135 | 310 |
| Do | 11 | 378820 | 217 | 239 | ---------- | 340 |
| Young | 3 | 379759 | ---------- | 245 | ---------- | ---------- |

## DISCUSSION

In 1943, when I discussed the skeletal remains from Platte and Clay Counties, Missouri, I summarized the small amount of skeletal data then available for comparison. Practically nothing has been added to the record since then. So far as Kansas is concerned, there has been added only the single skull from the Woodruff ossuary (Kivett, 1953). Since this skull is classed as Middle Woodland, it falls close chronologically to the Missouri Hopewellians (Stewart, 1943), and may be preceded by the Early (?) Woodland material from the Young site here being described. The material from this group of sites in turn is older than that from the Steed-Kisker (Middle Mississippi) site in Missouri (Stewart, 1943) and from the Doniphan (Historic) site here being described. Thus, it is logical now to make two sets of comparisons: (1) Between the specimens from the early sites and (2) between the specimens from the late sites. However, since the reverse order has been used above in presenting the new material, the comparisons also will be reversed.

*Doniphan vs. Steed-Kisker.*—The first thing to note about the skeletal remains from these late sites is that they give the impression of being massive in build. In part this is due to the predominance of males in both collections, and in part it is due to the roundness of the skulls, which accentuates the size of the faces. Yet it seems quite likely that more adequate collections will confirm such an impression.

Next it is noteworthy that the roundness of the skulls in both collections is due, at least in part, to cradleboard flattening. Just how much flattening has occurred in any one case is difficult to say. Also, the point of greatest compression is lower on the occiput in the Steed-Kisker series (Stewart 1943, pls. 49–50) than in the Doniphan series. Probably this represents a variation in cradling practice. However, the effect of compressing the lower part of the occiput has been to increase the vault height. Thus, the Steed-Kisker skulls appear to have higher vaults than the Doniphan skulls. Using a mean height index involving the biporionbregma height, 5 Steed-Kisker skulls (all males) range from 71.6 to 75.5, whereas 4 Doniphan skulls (2 males, 2 females) range from 68.4 to 75.1. More material will be needed to tell whether this observation is significant. Yet it seems likely that, if the Doniphan skulls had not been deformed, they would have been classed as lowheaded. The Steed-Kisker skulls give no hint as to their original shape.

Turning to the face, one is struck by the massiveness already mentioned. Beyond this it is difficult to tell which characters represent group differences and which are simply individual variations. It can be said only that both groups tend to the same sort of nasal structure, and especially to prominence of the nasal bones.

In the postcranial skeleton size again is the outstanding feature. Yet, except for one very tall individual in the Steed-Kisker series (femora No. 57), the difference between the two groups is not striking. The absence of septal apertures of the humerus is perhaps noteworthy also.

*Young vs. Woodruff and Missouri Hopewellians.*—Before making this comparison attention should be called to the contrast in type between the two skulls recovered from the Young site. No. 3 is hyperdolichocranic (63.4), whereas No. 5 is dolichocranic (73.0). Obviously, these skulls are undeformed. No. 3, unlike No. 5, also has a combination of facial features which reminds one of the African Negroes. The same facial appearance occurs in combination with extreme longheadedness in the cave dwellers of the Big Bend region of Texas (Stewart, 1935). The face of No. 5, on the other hand, is not so distinctive and does not suggest any particular group.

Unlike these two Early (?) Woodland skulls, the single Middle Woodland skull from the Woodruff ossuary is somewhat deformed and most of the Missouri Hopewellians are considerably and distinctively deformed. In spite of their altered shapes, the Hopewellians give indications of being fairly longheaded normally. On this score the Woodruff skull gives little indication. Thus one is easily persuaded to place the Early (?) Woodland skulls with the Hopewellians, largely on the basis of longheadedness and general gracility.

The Woodruff skull was regarded as male by Cumming (Kivett, 1953, p. 140), but to me it looks more like a female (the pelvis is missing). The published pictures of this skull (ibid., pl. 28) show the deformity to be like that common to the Doniphan series—high on the occiput and asymmetrical. Not so evident in the picture is the broken tip of the nose and the size disharmony between the fore- and back-parts of the mandible. Actually the ascending ramus of the mandible is of slight build as in most females, but the symphyseal area is high and heavy as in many males. Probably it is this combination of features which reminds one of the Doniphan skulls, rather than the earlier Woodland-Hopewell skulls. However, I am impressed by the high-headedness of the Woodruff skull, and, having but a single specimen, this makes me hesitate to place it with any particular group.

In view of this discussion of the skeletal evidence, something should be added to Wedel's remarks (see p. 91) about the putatively ancient Lansing skull found a few miles distant across the Missouri from the Steed-Kisker site. Wedel's analysis of Hrdlička's procedure in this case agrees with what I have written (Stewart, 1949, pp. 10–12) about the development of the concept of morphological dating. During the interval from 1902 to 1907 when he was studying the Lansing skull, Hrdlička had very little perspective on cranial types from the Plains. Not until he prepared the portion of his "Catalog of Crania" dealing with this area (Hrdlička, 1927) did he gain the perspective that enabled him to change some of the earlier attributions. Only then, too, did he realize that there was a lowheaded strain in the late tribes of this area. Characteristically, he did not correct his earlier statements about the Lansing skull. It is clear to me now that he continued to regard this skull as of the "Algonkin" type and hence of no great age.

By comparison with the fragile Young site specimens, the Lansing skull seems well preserved—even fresh looking, as was remarked at the time. However, the Young site material was not deeply buried and this probably accounts for the difference in preservation. In the absence of a face on the Lansing skull, extended comparison is out of the question. On the other hand, of the two skulls from the Young site only No. 5 is roughly similar in type to the Lansing skull. How closely these skulls of opposite sex compare is shown in figure 109, where stereographic drawings of top and side views appear, one skull superimposed on the other.

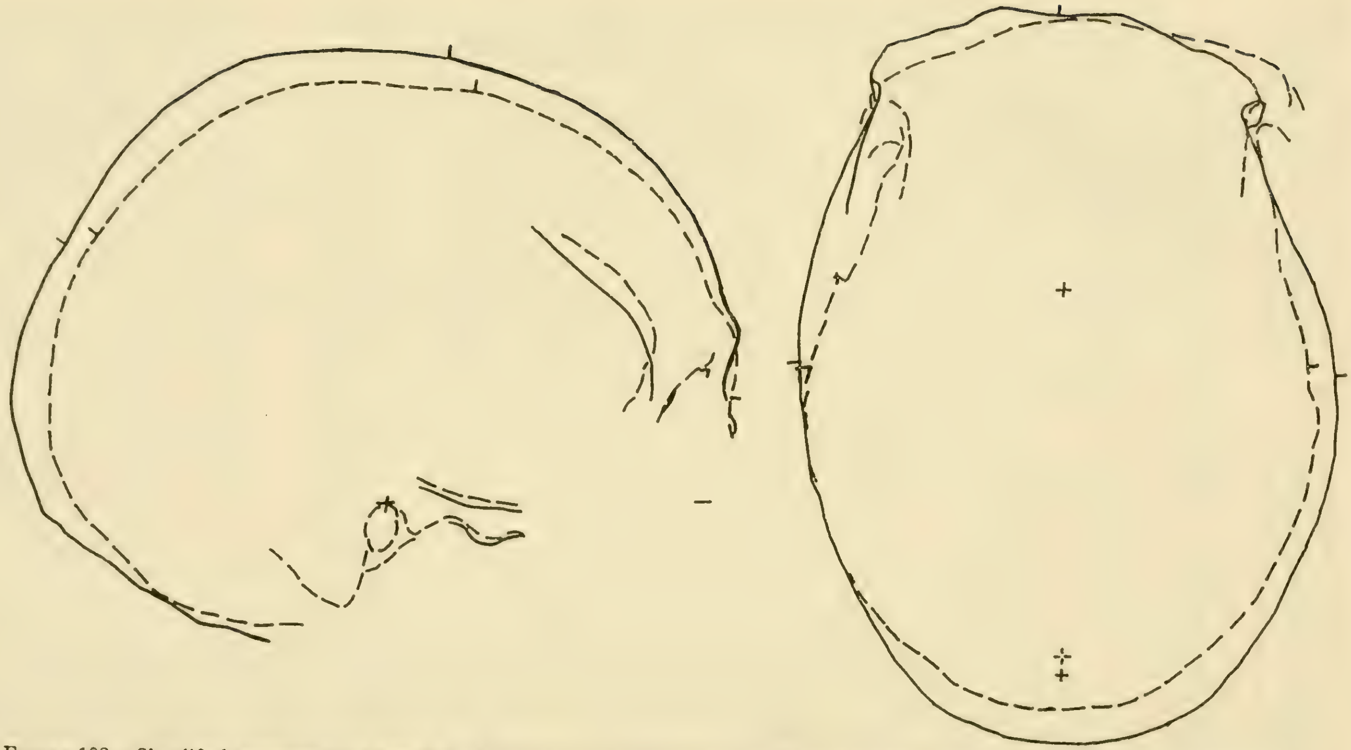

Figure 109.—Simplified stereographic views of the Lansing skull (solid line) and the Young site skull No. 5 (broken line). On the left the lateral views of these two skulls are superimposed with porion and nasion coinciding. On the right the top views are superimposed with bregma coinciding and lambda alining with midline. Note the marked asymmetry of the Lansing skull in the top view.

In lateral profile the main difference, aside from the disparity in size, is in the conformation of the occiput, the Lansing skull having a more prominent occiput. As seen from above, the distortion of the Lansing skull is very noticeable: the left side of the frontal extends forward more than the right and the outlines of the parietals are asymmetrical. Although the Lansing skull was assembled from many pieces, the asymmetries do not seem to be a product of the restoration. Owing to such defects nothing more can be learned from this comparison. Incidentally, the Lansing skull has a minimum frontal diameter of 94 mm., a frontal chord of 113 mm., and a resulting frontal index of 83.2. This compares with a frontal index of 83.5 for Young skull No. 5.

All of this simply bears out the impression of rough similarity with which we started and demonstrates the problem of interpreting the affiliation of a single defective skull. Certainly, if two skulls from a site, such as Young skulls Nos. 3 and 5, can be so different, it is not impossible that the Lansing skull fits into such a population.

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## EXPLANATION OF PLATES 1–97

### PLATE 1

Views at the Doniphan site, 14DP2.

*a*, Looking west toward Doniphan, across part of site 14DP2.

*b*, Looking west across site 14DP2, toward house 1 on hilltop at center.

*c*, House 2 after excavation, looking southwest.

## PLATE 2

Burials 1–4 at Doniphan site, 14DP2, presumably Kansa.

*a*, Burial 1, outside south wall of house 1; note leather lying across knees.
*b*, Burial 2, intrusive into entrance passage of house 1; note stump of post and worked shell near knees.
*c*, Burial 3, intrusive in northeast side of house 1.
*d*, Burial 4, semiseated adult partially covered with stones.

## PLATE 3

Burials, some slab-covered, in situ at Doniphan site.

*a*, Group of stone-covered graves, Nos. 6–8, after clearing of topsoil.
*b*, Burial 8, reclining and partly stone-covered.
*c*, Burial 10, fully extended and without stone covering.
*d*, Burial 11, partly covered with slabs.

## PLATE 4

Restored pottery vessels from house 2, Doniphan site.

*a*, Plainware vessel from house 2, cache 2, diameter 24 cm. (USNM 381622).
*b*, Vessel with trailed shoulder decoration from house 2, cache 1, diameter 26.5 cm. (USNM 381644).
*c*, Cord-roughened vessel from house 2, cache 2, diameter 22 cm. (USNM 381621).

## PLATE 5

Shell, bone, and antler artifacts, Doniphan site.

*a*, *b*, *g*, from house sites (Nebraska aspect); all others from cache pits presumed to be 18th century Kansa.

## PLATE 6

Catlinite and limestone artifacts, Doniphan site. All from cache pits presumed to be 18th century Kansa. Actual size. (USNM Neg. 44762 H).

## PLATE 7

Iron and brass artifacts, Doniphan site. All from cache pits, except *i* from burial 5. Length of *e*, 16.5 cm. (USNM Neg. 44762 B).

## PLATE 8

House 1 (*a*) and restored pottery vessel, Fanning site, 14DP1.

*a*, House 1, excavated, from the northeast; entrance to southwest.
*b*, Restored pottery vessel with four tapered strap handles, from cache pit 12, Fanning site. Diameter 27.5 cm. (USNM 381751).

## PLATE 9

Trailed and plainware potsherds and vessel handles, Fanning site.

## PLATE 10

Trailed potsherds and miniature bowl, Fanning site.

## PLATE 11

Rimsherds of Lower Loup Focus types, Fanning site.

*a–f*, Grit-tempered, collared, usually with multiple handle scars.
*g*, *h*, Shell-tempered, with thickened rim and diagonal incisions. Actual size (USNM Neg. 44762).

### PLATE 12

Miscellaneous artifacts from Fanning site (USNM Neg. 34230 A).

### PLATE 13

Brass and iron (*b, c*) objects, Fanning site. Length of *a*, 16.5 cm. (USNM Neg. 44762 F).

### PLATE 14

Burial mound excavations in Doniphan County.

*a*, Guthrie site, burial mound on hilltop at right.
*b, c*, Guthrie site, burial pit before and after removal of slab cover and grave fill.
*d*, Matherson burial mound, covering slabs still in situ.

### PLATE 15

Surface finds of early-type projectile points from Doniphan and Seward Counties, Kansas. *a, b, d–g, i, k*, Fenn Ward collection; *c, h, j*, Shelby Gilmore collection; *l–o*, USNM 382038.

*a*, Near Highland, Doniphan County; gray chert, blunted proximal edges, thinned base; 52 x 22 x 6.5 mm.
*b*, Near Highland, Doniphan County; gray mottled chert, blunted proximal edges, thinned base; 46 x 23 x 5 mm.
*c*, Shelby Gilmore farm, 2½ miles north of Highland, Doniphan County; gray chert, blunted edges; 44 x 20 x 4 mm.
*d*, Near Highland, Doniphan County; light gray chert, blunted proximal edges; 52 x 20 x 7 mm.
*e*, 2 miles west and 3 miles north of Doniphan, Doniphan County; black jasper, proximal edges blunted, base thinned; 60 x 29 x 6 mm.
*f*, 5 miles southeast of Highland; mottled gray and tan chert; proximal edges blunted; 99 x 34 x 7 mm.
*g*, Near Highland; light gray chert, proximal edges blunted; 65 x 27 x 5.5 mm.
*h*, Shelby Gilmore farm, 2½ miles north of Highland, Kans.; gray chert, broadly fluted, fine edge chipping, base missing.
*i*, 1 mile east and 2½ miles south of Troy, Doniphan County; light gray chert, broadly fluted, fine edge chipping; 43 x 20 x 4 mm.
*j*, Shelby Gilmore farm, 2½ miles north of Highland; light-gray chert, fluted, proximal edges blunted; 55 x 23 x 6 mm.
*k*, Near Highland; light-gray chert, proximal edges somewhat blunted; 97 x 32 x 8 mm.
*l*, Near Liberal, Seward County; Alibates dolomite, fluted base fragment.
*m*, Near Liberal, Seward County; Alibates dolomite, fluted midsection.
*n*, Near Liberal, Seward County; Alibates dolomite, fluted base fragment.
*o*, Near Liberal, Seward County; Alibates dolomite, thinned basal fragment.

### PLATE 16

Excavations near Manhattan.

*a*, House 1, Kansa village site, 14PO24, near mouth of Blue River east of Manhattan.
*b*, Portion of Griffing site, 14RY21, on Wildcat Creek west of Manhattan.
*c*, House 1, Griffing site, looking south.

### PLATE 17

Riley Cord-Roughened potsherds from Griffing site.

### PLATE 18

Miscellaneous objects from Kansa village site 14PO24.

*a–e*, from village site excavations; others from surface of burial ground. Length of *a*, 20 cm. (USNM Neg. 44762 D)

### PLATE 19

Miscellaneous iron and brass objects from Kansa village site 14PO24. All from village site excavations. Length of *f*, 13 cm. (USNM Neg. 44762 C).

### PLATE 20

Stone, bone, and shell objects from burial mounds near Manhattan. Chipped points, bone beads, and shell pendants from Fremont Point Mound No. 1. Pierced and incised bear canine tooth from Fremont Point Mound No. 2. (All collected by Dr. Norman L. Roberts, Manhattan.)

### PLATE 21

Tobias site (14RC8), Rice County.

*a*, General view looking north toward timbered valley of Little Arkansas River.

*b*, *c*, Start of excavations in mound 17 complex.

### PLATE 22

Excavations at Tobias site, Rice County.

*a*, Sandstone boulders and human remains in fill of basin 1, mound 17 complex.

*b*, Disarticulated human bones in fill of basin 1, mound 17 complex.

### PLATE 23

Excavations at Tobias site, Rice County.

*a*, Basin 2, mound 17 complex, under excavation, looking northeast.

*b*, Pottery, charred basket and corn, pipe, and other materials on floor of basin 2, mound 17 complex.

### PLATE 24

Excavations at Tobias site, Rice County.

*a*, Basin 1, mound 17 complex, looking northwest.

*b*, Basin 2, mound 17 complex, looking northeast; basin cleared, except for two control blocks.

### PLATE 25

Miscellaneous features in mound 17 complex, Tobias site.

*a*, Mussel shells, bone awls, and chipped stone on floor of basin 2.

*b*, Glass, bone, and turquoise necklace on floor of basin 1.

*c*, Charred remains of coiled basket, floor of basin 2.

*d*, Charred corn, floor of basin 2.

### PLATE 26

Restored pottery vessels of type Geneseo Plain, from Tobias site, Rice County.

*a*, USNM 388754, height 23 cm., diameter 21.5 cm.

*b*, USNM 388622, height 21 cm., diameter 19 cm.

*c*, USNM 388898, height 24 cm., diameter 23 cm.

PLATE 27

Restored pottery vessels from Tobias site, Rice County.

*a*, USNM 388644, height 36 cm., diameter 31 cm., type Geneseo Plain.

*b*, USNM 388590, diameter 31.7 cm., type Geneseo Red-filmed, basal portion missing.

*c*, USNM 388624, height 5 cm., diameter 6 cm., miniature vessel.

PLATE 28

Restored pottery vessels, type Geneseo Simple Stamped, from Tobias site, Rice County.

*a*, USNM 388623, height 24 cm., diameter 29 cm.

*b*, USNM 388983, height 27 cm., diameter 27.3 cm.

PLATE 29

Restored pottery vessels from Tobias site, Rice County.

*a*, USNM 388888, height 30.5 cm., diameter 28 cm.; type Geneseo Simple Stamped.

*b*, USNM 388687, height 30 cm., diameter 29 cm.; check stamped.

PLATE 30

Rimsherds, handles, and sherd disks from Tobias site, Rice County. Height of *f*, 10 cm.

PLATE 31

Bone and antler implements from Tobias and Malone (*c*) sites, Rice County.

PLATE 32

Bone awls and polishing (?) tools from various Little River Focus sites in Rice County. (Malone site, *c*, *m*; Thompson site, *a*, *b*, *d*, *j*, *o*; all others from Tobias site.)

PLATE 33

Bone projectile points and bipointed objects (*o*–*t*) from Tobias site, Rice County.

PLATE 34

Worked antler strips and fragments, and cut mammal bone fragment (*l*), from Tobias site, Rice County.

PLATE 35

Bone and antler artifacts from Tobias site, Rice County, and fragment of bone paint applicator (*h*) from Larcom-Haggard site, Cowley County.

PLATE 36

Bone and iron (*k*, *l*) objects from various Great Bend Aspect sites in Rice and Cowley (*b*, *c*) Counties.

Malone site, Rice County, *j*; Thompson site, Rice County, *f*, *h*, *i*; Elliott site, Cowley County, *b*, *c*; Tobias site, Rice County, *a*, *d*, *e*, *g*, *k*, *l*.

PLATE 37

Chipped projectile points from Tobias site, Rice County.

PLATE 38

Stemmed (*b*–*g*) and plain-shafted (*h*–*m*) chipped drills from Tobias site, Rice County.

### PLATE 39

Expanded-base chipped drills from Tobias site, Rice County.

### PLATE 40

Chipped knives from Tobias and Thompson (*d, k, l*) sites, Rice County.

### PLATE 41

Top and side views of chipped end scrapers from Tobias site, Rice County.

### PLATE 42

Grooved mauls and shaft polishers from various sites in Rice and Cowley Counties. Length of *a*, 10 cm.; all others to same scale except *h, i*. (*a, b, d, f, g, i*, Tobias site, Rice County; *c*, Thompson site, Rice County; *h*, Paint Creek site, McPherson County, private collection of J. H. Fries; *e*, Larcom-Haggard site, Cowley County. *a* and *b* are Type I mauls; *c* and *e*, Type II; *g, d*, Type III; *f*, Type IV. Diameter of *h*, 75–85 mm., thickness 40–43 mm.)

### PLATE 43

Grinding stones from Tobias (*a, d, f, g, h*) and Thompson (*b, c, e*) sites, Rice County. (Not to scale.)

### PLATE 44

Sandstone disks and abrading stones from Tobias and Malone (*f, h, i*) sites, Rice County.

### PLATE 45

Stone pipes from Tobias site and vicinity, Rice County.

Length of *i*, 77 mm.; *b–e, h*, to same scale.

*a, f, g*, Surface finds in collection of Lowell Peverley; all others from Tobias site excavations, U. S. National Museum.

### PLATE 46

Miscellaneous objects from Rice and Cowley (No. 456) Counties.

*a*, Chipped blade and necklace of glass, bird bone, and turquoise from basin 1, mound 17 complex, Tobias site.

*b*, Shell ornaments and implements.

### PLATE 47

Miscellaneous objects from Rice and Doniphan (*d, g*) Counties.

Upper and *a–c*, worked shell from Tobias site, Rice County; *f*, miniature pot from pit 1, Tobias site (USNM 388591); *d, g*, small lead cross and catlinite pipe, Doniphan site.

### PLATE 48

Thompson site, 14RC9, Rice County.

*a*, Portion of village site and mound 1 excavations (center); looking southwest toward Little Arkansas River.

*b*, Trenching mound 1; looking northwest.

### PLATE 49

Pueblo and other exotic potsherds from various sites in Rice and Cowley Counties. From Rice County: *a–d, g*, Thompson site; *f*, Tobias site. From Cowley County: *e, h, j, k*, Larcom-Haggard site; *i*, Arkansas City Country Club site.

PLATE 50

Oxidized chain mail fragments, pit 4, Thompson site (USNM 389152). Enlarged. ×2.

PLATE 51

Larcom-Haggard site, 14CO1, Cowley County.

*a*, From northwest, toward Walnut River; site in middle foreground, beyond railroad tracks.

*b*, *c*, From southeast, showing part of village terrace and excavations.

PLATE 52

Arkansas City Country Club site, 14CO3, Cowley County.

*a*, Mound 1 excavations, looking northwest. Note flat-topped mounds in background, left of clubhouse.

*b*, Mound 1 excavations, looking south; pit C, unexcavated, at right in excavation.

PLATE 53

Restored pottery vessels, type Cowley Plain, from various sites in Cowley County. *a–c*, Arkansas City Country Club, mound 1, pit B; *d*, Elliott site, pit 8. Height of *a*, 28 cm.; others to same scale.

PLATE 54

Restored pottery vessels, type Cowley Plain, from Larcom-Haggard site. Collection of Louis Essex.

*a*, Height 31.8 cm., diameter 26.3 cm.; *b*, height 17.8 cm., diameter 16.8 cm.

PLATE 55

Socketed scapula hoes from Cowley County sites.

PLATE 56

Bone and stone artifacts from Cowley and Lane County sites. Length of *b*, 15.8 cm.; *a*, *c–g*, to same scale. *k*, Pottorff site, Lane County.

PLATE 57

Pottorff (14LA1) and Risston (14SC4) sites on Salt Creek, on Lane-Scott County line.

*a*, Pottorff site looking southeast across Salt Creek and main site terrace.

*b*, Risston site, center, and Salt Creek beyond, looking southeast.

PLATE 58

Houses 1 and 2 excavations, Pottorff site, 14LA1.

*a*, House 1 from the west, showing posthole arrangement and central fireplace.

*b*, House 2 from the west, entrance of house at lower right.

*c*, Relationship of house 1, right, to house 2 at lower level.

PLATE 59

Excavations at the Pottorff site, 14LA1.

*a*, East face of test pit, between Stakes 019:12 (left) and 020:2, Area C, showing burned areas and refuse bone.

*b*, West face of test pit in Square T27:4, showing Upper Republican stratum (A), Woodland stratum (B), unidentified stratum (C), and sterile deposits (D) intervening.

### PLATE 60

Pottery from Upper Republican and Woodland occupations, Pottorff site.

*a–j*, Upper Republican rim and body sherds; *k*, rocker-marked sherd from beneath floor of house 2; *l–n*, Woodland body sherds from lower stratum (Occupation B).

### PLATE 61

Bone and shell objects, Pottorff site. All from Upper Republican stratum, except *m* and *n*.

### PLATE 62

Projectile points, drills, and end scrapers, Pottorff site.

### PLATE 63

Knives and other chipped forms, Pottorff site.

### PLATE 64

Stone and bone objects from Occupation B (Woodland), Pottorff site.

### PLATE 65

Scott County State Park and site 14SC1.

*a*, Looking south up the Ladder (Beaver?) Creek valley and across Lake McBride. Arrow points to pueblo ruin and nearby excavations at site 14SC1.

*b*, Trench in test 2 through refuse deposits north of pueblo ruin; 14SC1. Foundation stones in pueblo ruin visible as light spot in shadowed end of trench, behind kneeling figure.

### PLATE 66

Excavations at 14SC1, in Scott County State Park.

*a*, *b*, Test 1 and cache pit, south of pueblo ruin.

*c*, Test 3 and roasting pit No. 1, lower left.

*d*, Hearth on terrace east of Big Spring, on right bank of Ladder Creek.

### PLATE 67

Roasting or baking pit No. 3, Scott County State Park.

*a*, Pit sectioned, half cleared to stones on floor.

*b*, Pit sectioned, fill partly removed to show profile and mouth below surface disturbance.

*c*, Pit cleared, burned stones in situ on floor.

*d*, Pit fully cleared, showing burning of wall as light-colored lip below broken edge.

### PLATE 68

Restored pottery vessels from 14SC1, Scott County.

*a*, Small vessel, restored, from test 2. Height 7 cm. (USNM 386959).

*b*, Large jar collected by A. T. Hill from cache pit near bathhouse during draining of Lake McBride, 1944–45. Height 36 cm., diam. 30–35 cm. Dismal River Aspect.

### PLATE 69

Pottery objects from Scott County site, 14SC1. Actual size.

*a*, Tewa Polychrome sherd, shore of Lake McBride.

*b–d*, *h*, Pottery pipe fragments with incised and pricked decoration.

*g*, *i–k*, Undecorated pottery pipes, all tubular in form except *j*.

PLATE 70

Bone and shell artifacts from 14SC1, Scott County.

*a*, bird-bone whistle; *b–c*, bone beads; *d*, paint applicator; *e*, bone ornament fragment; *f*, worked bison hyoid; *g*, needle fragment; *h*, projectile point; *i*, polishing tool; *j*, *k*, shell ornaments; *l*, *m*, awls of split legbone; *n*, awl of split rib; *o*, *p*, splinter awls; *q*, *r*, "rib-edge" awls. Length of *a*, 7.9 cm. Dismal River Aspect.

PLATE 71

Bone artifacts from 14SC1, Scott County.

*a–d*, Bison metapodial fleshing tools or grainers.

*f–j*, Finished and striated rib implements, purpose unknown. Dismal River Aspect.

PLATE 72

Projectile points, drills, and end scrapers from 14SC1, Scott County. Dismal River Aspect.

PLATE 73

Stone, iron (*g*), and pottery (*h*) objects from 14SC1, Scott County.

*a–c*, Scrapers and cutting or chopping tools; *d–f*, knives; *g*, iron knife blade; *g′*, marcasite concretion; *h*, miniature pottery vessel; *i*, mano; *j*, limestone pipe blank (?). Dismal River Aspect.

PLATE 74

Young burial site, 14SC2, Scott County.

*A*, Burials under excavation; Lake McBride and Scott County State Park in background.

*B*, Stone and bone artifacts from burials 3 and 5. *a*, stemmed projectile point; *b*, drill (burial 5); *c*, bone awl; *d*, bone beads; *e*, *g*, top and, *f*, side views of split-pebble quartzite scrapers.

PLATE 75

Burials in situ, Young burial site, Scott County.

*a*, Burial 1, showing stones in association.

*b*, Burial 3, adult female, with terrapin carapace lying over right elbow.

*c*, Burial 5, adult female, with artifacts visible under left tibia and knee.

PLATE 76

Petroglyphs at Inscription Rock, 14EW1, Ellsworth County. Petroglyph locality No. 1. Photographs by G. L. Whiteford.

PLATE 77

Petroglyphs from various localities in Kansas.

*a*, Inscription Rock, petroglyph site No. 1, Ellsworth County.

*b*, Petroglyph site No. 6, 14RC10, Rice County.

*c*, Petroglyph site No. 7, 14RC11, Rice County.

*d*, Petroglyph site No. 10, 14MY1, near Liberty, Montgomery County. Note war-bonneted horsemen at lower center to left of watch.

PLATE 78

Petroglyph sites in Rice County.

*a*, Spriggs Rocks near Little River; petroglyph site No. 5, 14RC1.

*b*, Sandstone bluff at spring, petroglyph site No. 6, 14RC10.

### PLATE 79

Anthropomorphic and other petroglyphs at Spriggs Rocks, Rice County.

### PLATE 80

Potsherds from the Roniger site, 14CS1, in Chase County.

*a–e*, Middle Woodland (Hopewellian) sherds, showing dentate stamping, zoned decoration, punched bosses, cord-wrapped dowel impressions, and other features. (From Roniger collection, Bazaar, Kans.)

*f–j*, Smoky Hill Aspect sherds, probably type Riley Cord-roughened, surface finds in zone showing burned house wattle, small projectile points, etc. *f*, *g*, *i*, rimsherds. (From Roniger collection, Bazaar, Kans.)

### PLATE 81

Potsherds from Pratt site, 14PT1.

*a*, *b*, *d*, *e*, Cord-roughened rim and body sherds.

*c*, *f*, Simple stamped rimsherds suggesting Dismal River type Scott Plain.

*g*, Shell-tempered rimsherds with pinched-up neck nodes.

*h*, *l*, *m*, Rio Grande glaze-decorated sherds, Mera's "group C" or Kidder's "Glaze III," date circa 1450–75.

*i*, Biscuit B (Bandelier Black-on-gray) sherd, Tewa area north of Santa Fe, circa 1425–50 to 1525–50.

*k*, Unidentified sherd with traces of black paint. All from Eugene Wing collection, Pratt, Kans.

### PLATE 82

Chipped and ground stone objects from Pratt site, 14PT1.

*a*, *b*, Projectile points; *c*, drilled and polished turquoise; *d–f*, drills; *g*, pipe fragment; *h*, *i*, end scrapers; *j*, *l–q*, knives; *k*, reamer or large drill. (All from Eugene Wing collection, Pratt, Kans.)

### PLATE 83

Bone and ground stone objects from Pratt site, 14PT1. All from Eugene Wing collection, Pratt, Kans.

### PLATE 84

Miscellaneous specimens from various sites in Kansas.

*a*, Shell hair pipes, *b*, glass beads, and *c*, clay trade pipe, from Indian grave, 14PT2, near Pratt, all from Eugene Wing collection; *d*, replica of stone disk pipe from White Rock site, 14JW1, courtesy of A. T. Hill; *e*, steatite pipe, Wyandotte County (USNM 326648); *f*, indurated clay pipe Doniphan County (F. Ward collection, Highland); *g*, boatstone from Labette County (USNM 232588).

### PLATE 85

Salina burial pit, 14SA1, Saline County.

*a*, Portion of burials from southwest corner, 1940.

*b*, Flexed, semiflexed, and child burials, 1940.

### PLATE 86

Salina burial pit, 14SA1, Saline County.

*a*, Adult burial 81 and pottery vessel 55, in situ.

*b*, Burials 111 and 113, and pottery vessel 110, in situ.

### PLATE 87

Pottery vessels from Salina village and burial site, 14SA1.
*a*, Globular jar (No. 110), 15 cm. diameter, 15 cm. height.
*b*, Restored jar from house 1, diameter 37 cm., height 31 cm.

### PLATE 88

Pottery vessels from Salina village site, 14SA1.
*a*, From cache 5, house 1; diameter 29 cm., height 26 cm.
*b*, From fireplace, house 1; diameter 33 cm., height 33 cm.

### PLATE 89

Pottery vessels from Salina burial pit, 14SA1.
*a*, No. 73, diameter 18.5 cm., height 17 cm.
*b*, No. 84, diameter 16 cm., height 13.5 cm.
*c*, No number, diameter 14 cm., height 12 cm.

### PLATE 90

Pottery vessels from Salina burial pit, 14SA1.
*a*, No. 28, diameter 8.9 cm., height 8.9 cm.
*b*, No. 88, diameter 14 cm., height 11.5 cm.
*c*, No number, diameter 13.5 cm., height 11 cm.

### PLATE 91

Pottery from Salina village and burial site, 14SA1.
*a*, Cord-roughened and incised vessel (cast), diameter 20 cm., height 17 cm.
*b*, Effigy pipe fragment from house 1, cache 1.
*c*, Crockett Curvilinear Incised bowl fragment (see also fig. 95).

### PLATE 92

Objects of stone, pottery (*i*), antler (*h*), and shell from Salina village and burial site, 14SA1. Length of *b*, 25.5 cm.; *a*, *c–e*, to same scale. Length of *k*, 10 cm.; *f–i*, to same scale.

### PLATE 93

Neodesha "fort," Wilson County, 14WN1.
*a*, Neodesha "fort" as it is thought to have appeared about 1870; sketch by T. M. Galey.
*b*, Remaining segments of Neodesha "fort"; sketch by T. M. Galey.

### PLATE 94

Four views of the Doniphan site skull No. 3.

### PLATE 95

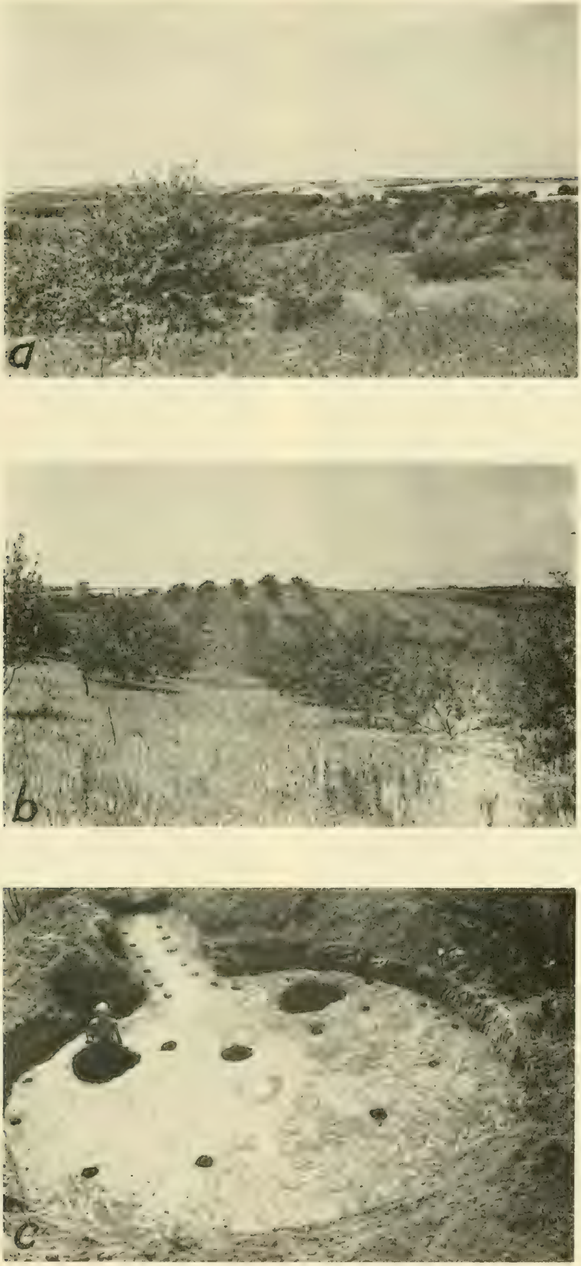
Four views of the Doniphan site skull No. 4.

### PLATE 96

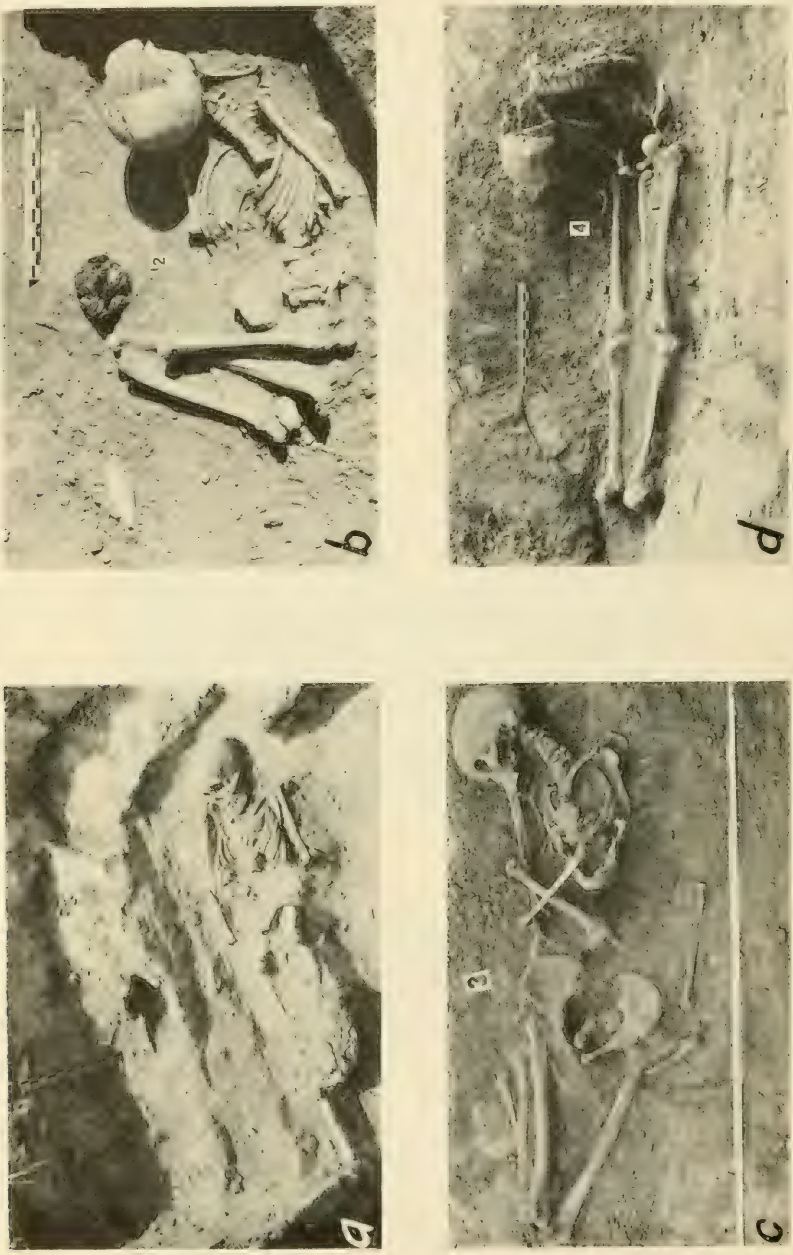
Four views of the Doniphan site skull No. 10.

### PLATE 97

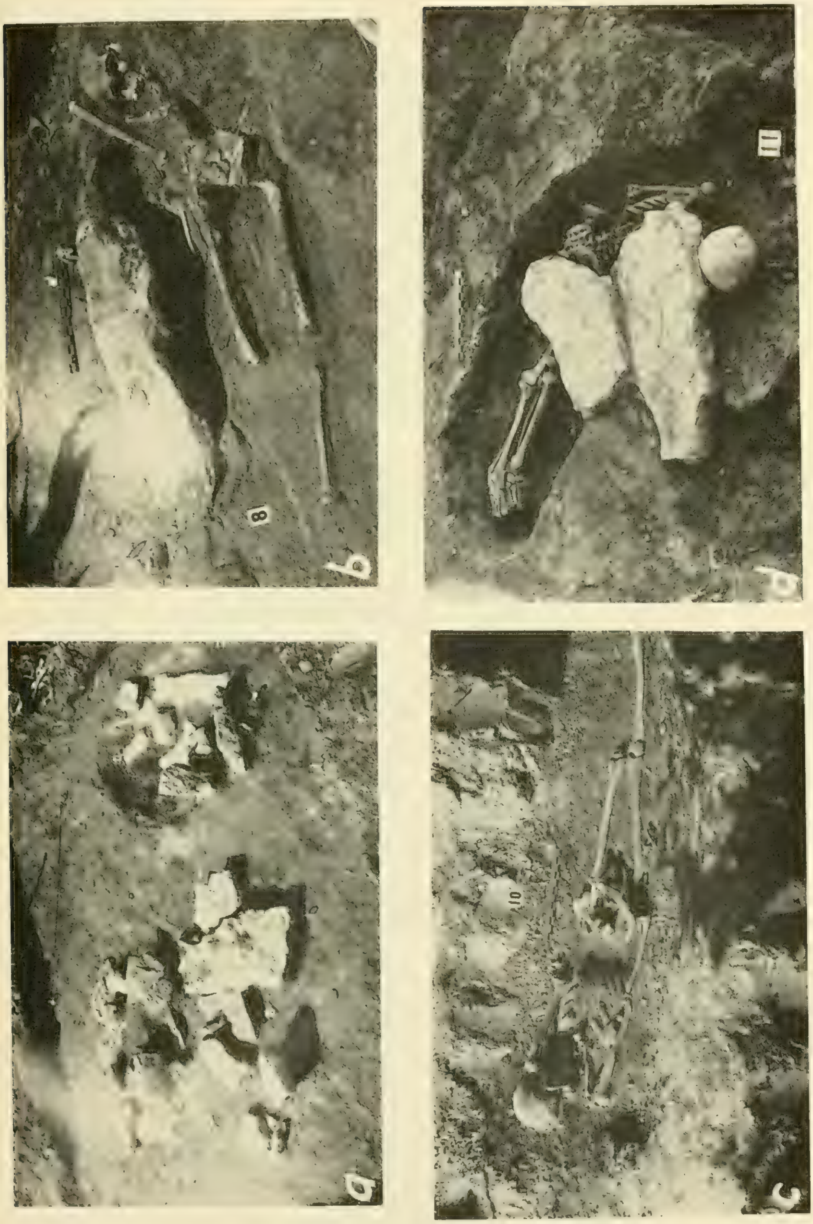
Four views of the Doniphan site skull No. 11.



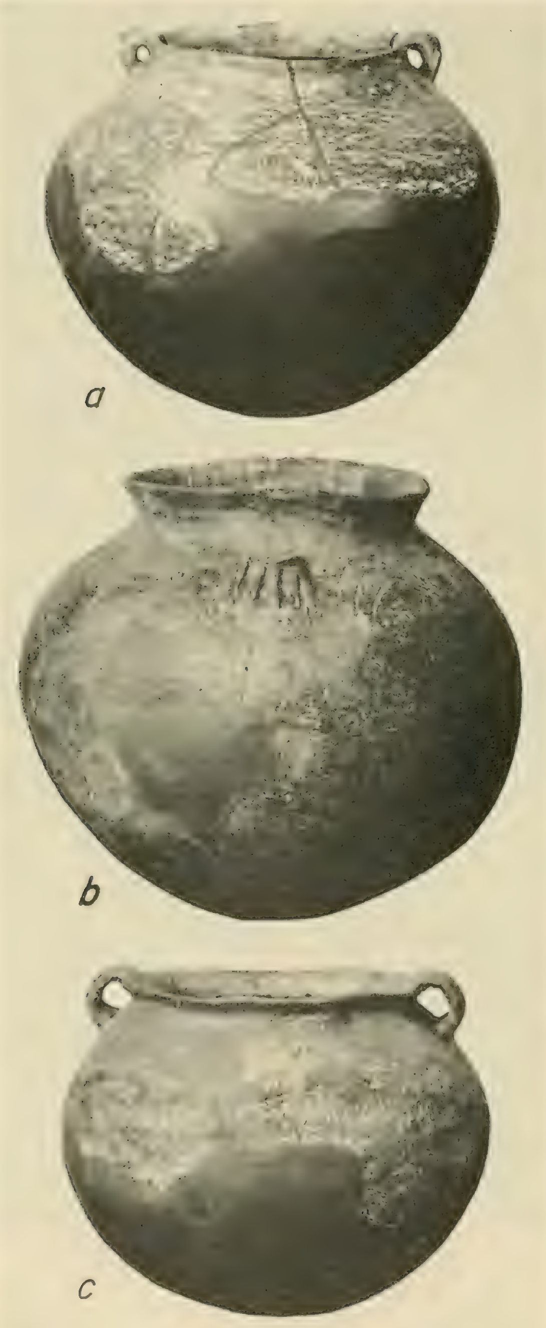
Views at the Doniphan site, 14DP2.



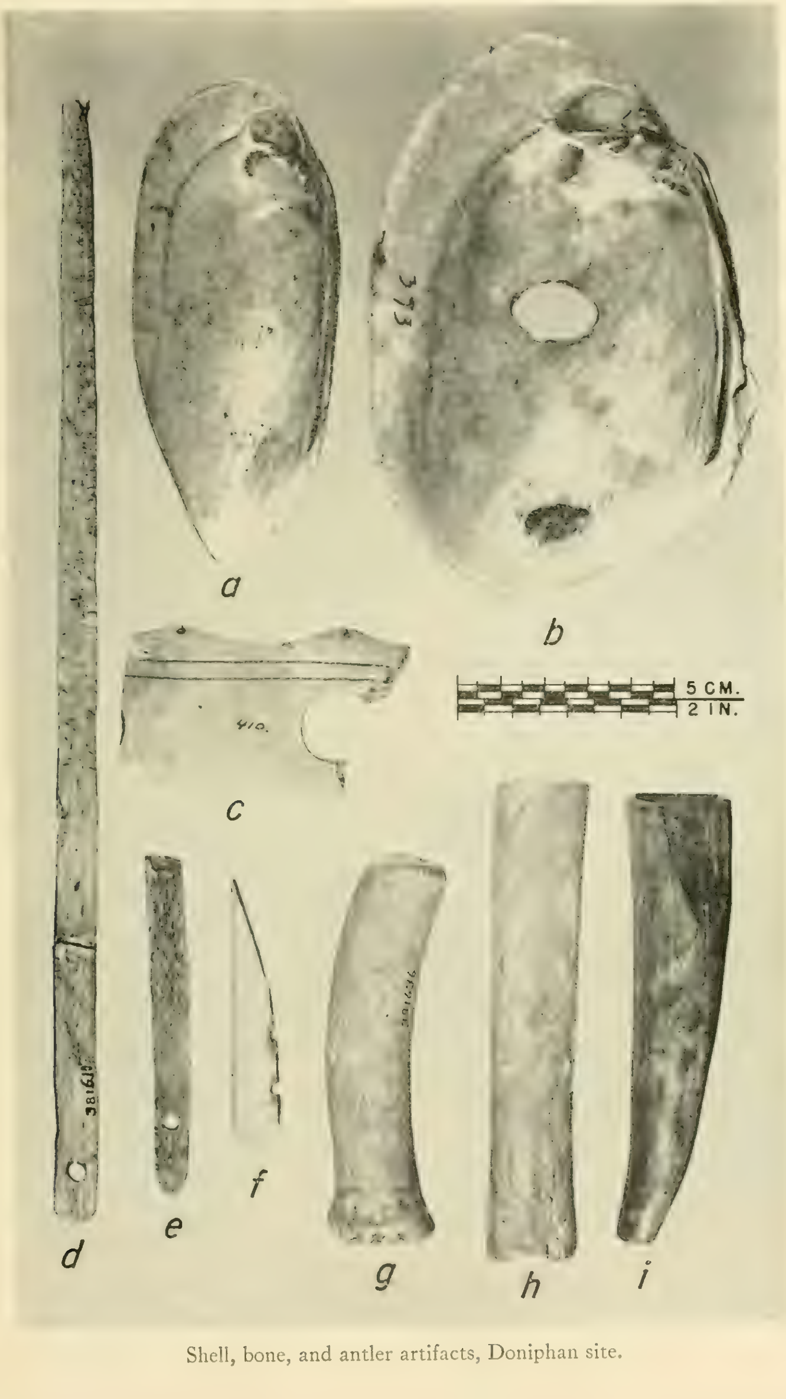
Burials 1–4 at Doniphan site 14DP2, presumably Kansa.



Burials, some slab covered, in situ at Doniphan site.



Restored pottery vessels from house 2, Doniphan site.


a
b
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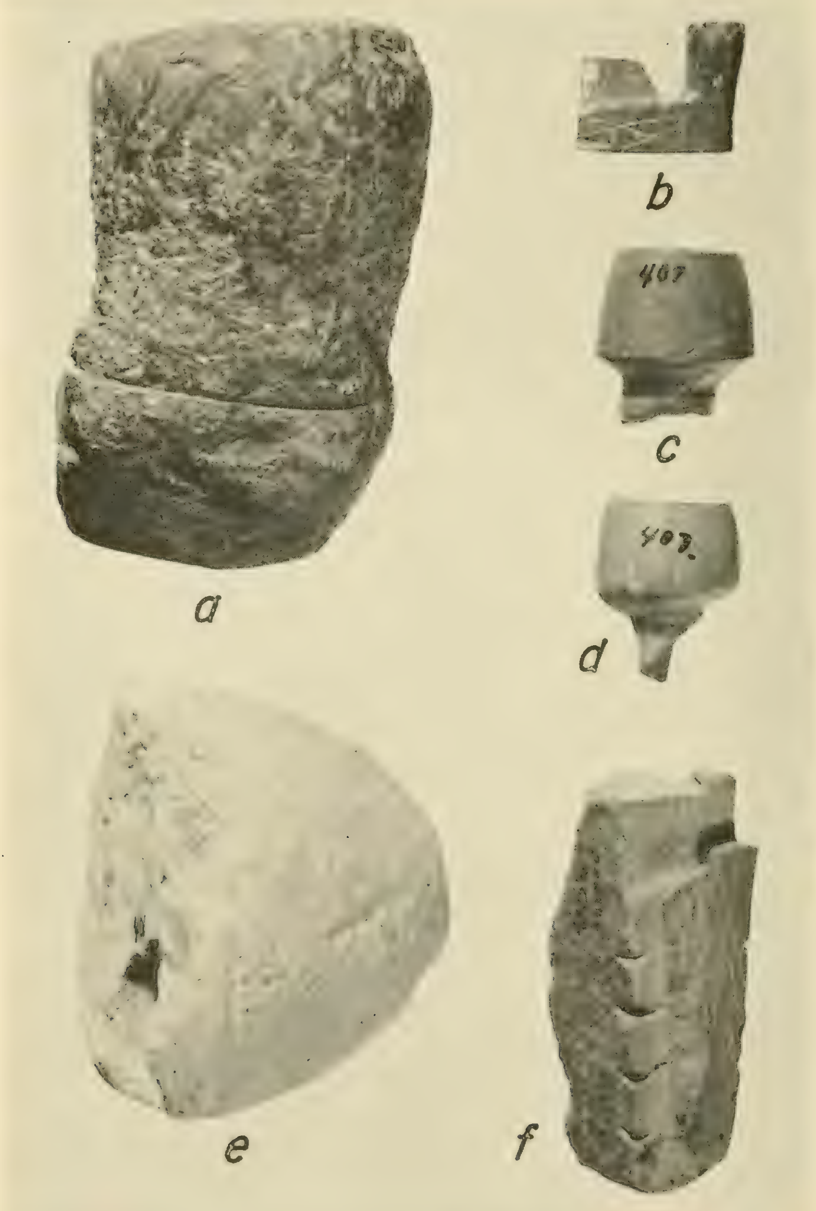
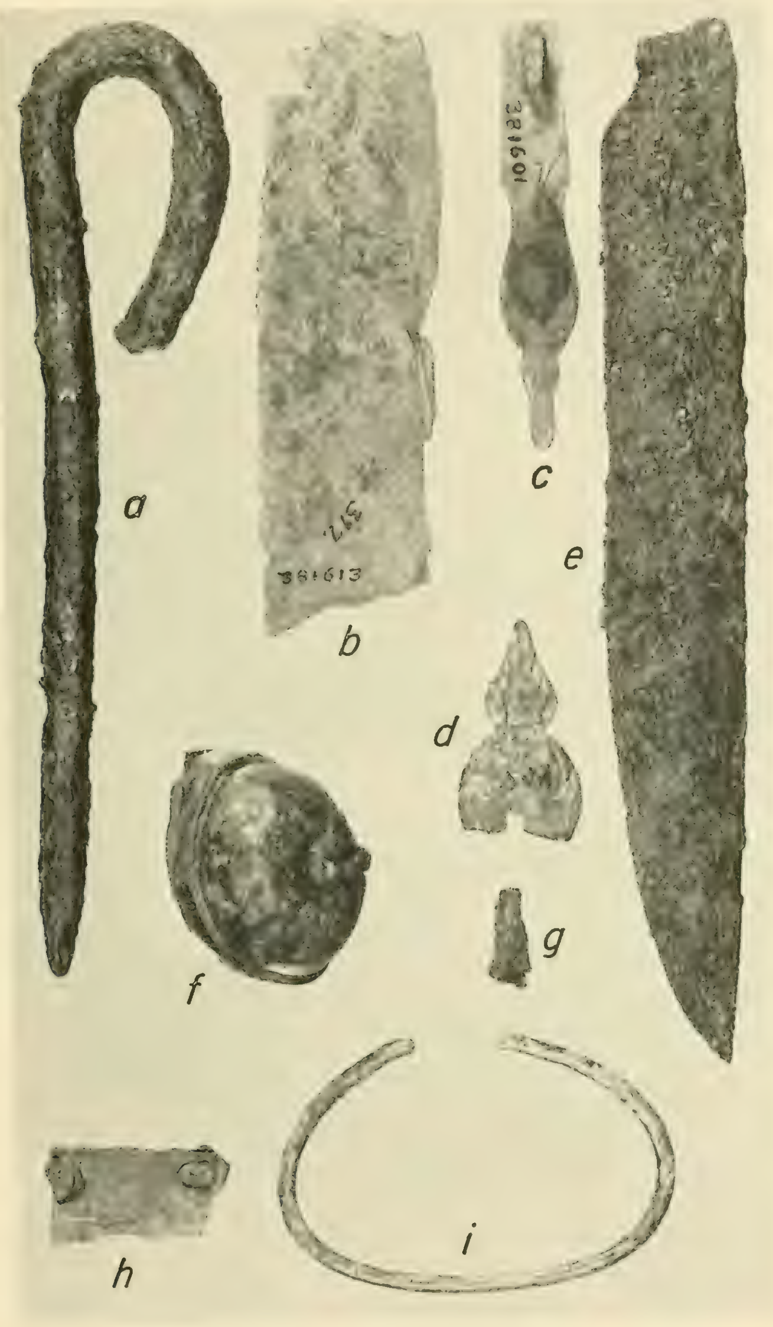
h
i
5 CM.
2 IN.
373
410.
381610
381636

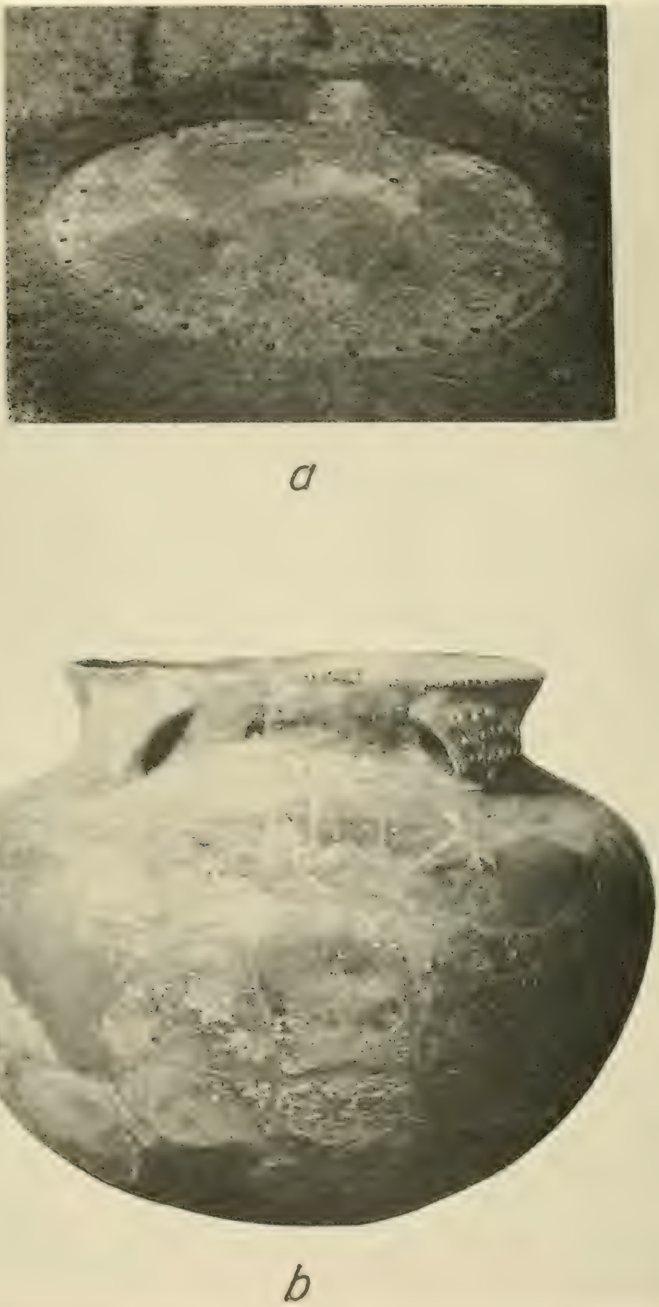
Shell, bone, and antler artifacts, Doniphan site.


a
b
407
c
403.
d
e
f

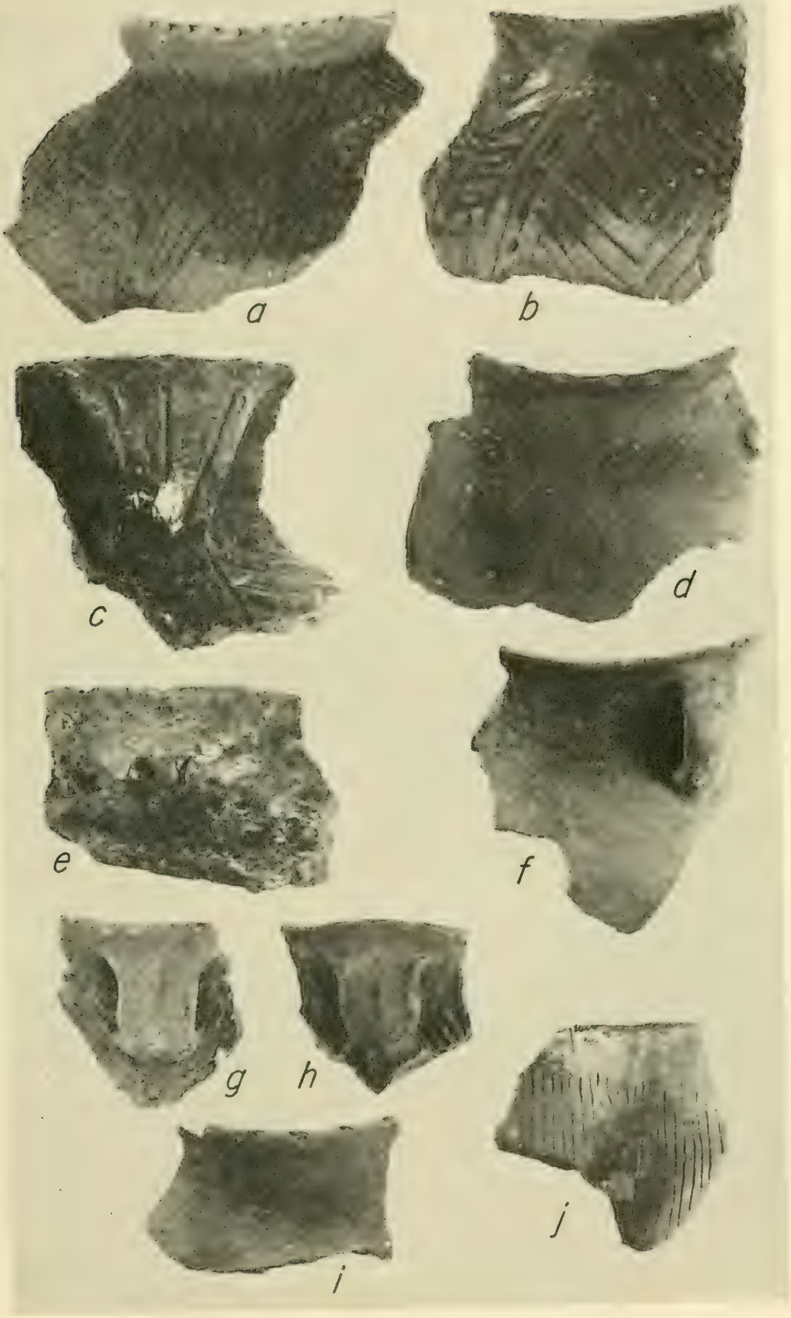
Catlinite and limestone artifacts, Doniphan site.


a
b
381613
381601
c
d
e
f
g
h
i

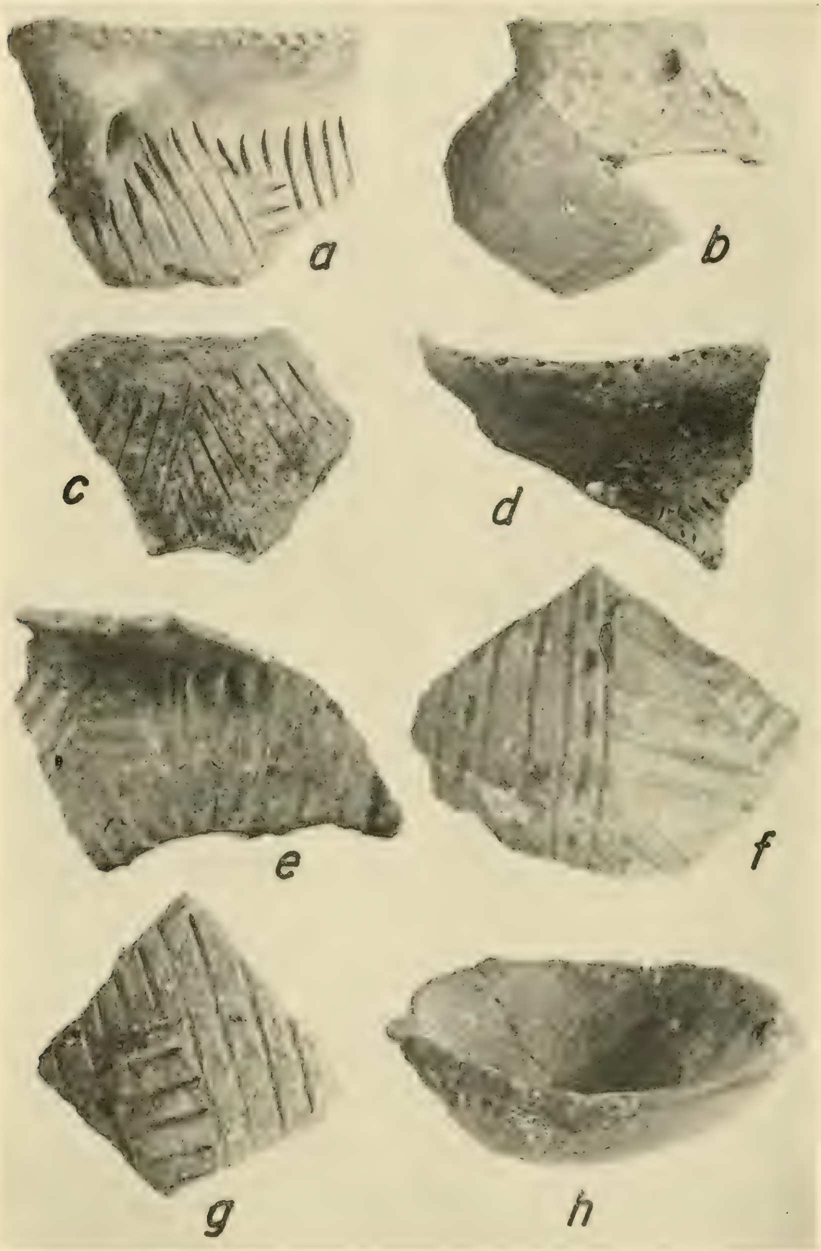
Iron and brass artifacts, Doniphan site.



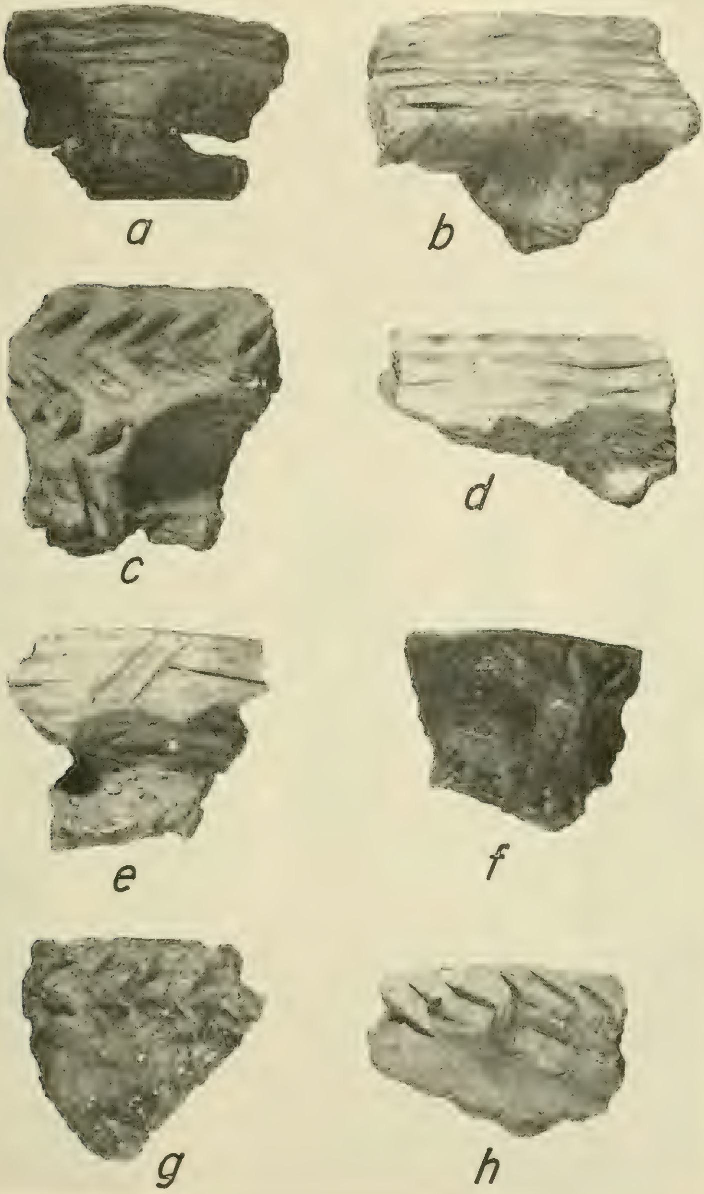
Fanning site, 14DP1. *a*, House 1. *b*, Restored pottery vessel.



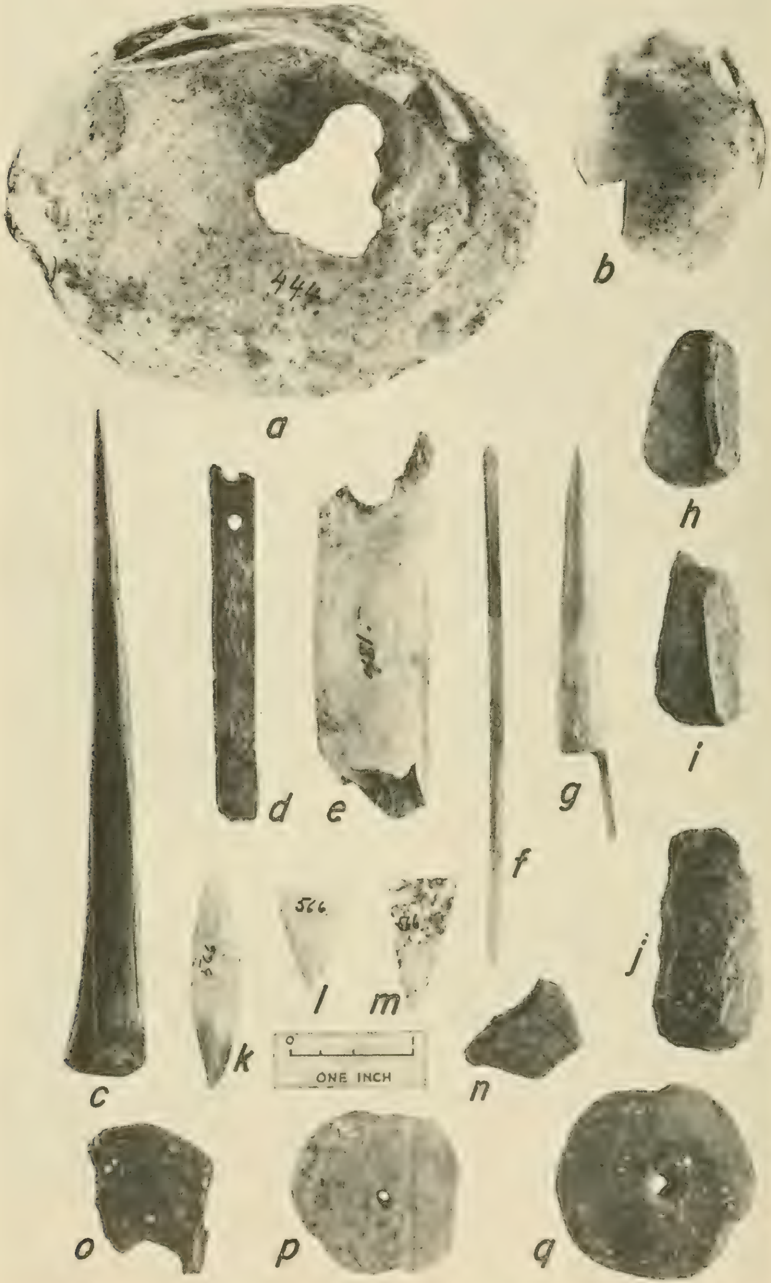
Trailed and plainware potsherds and vessel handles, Fanning site.



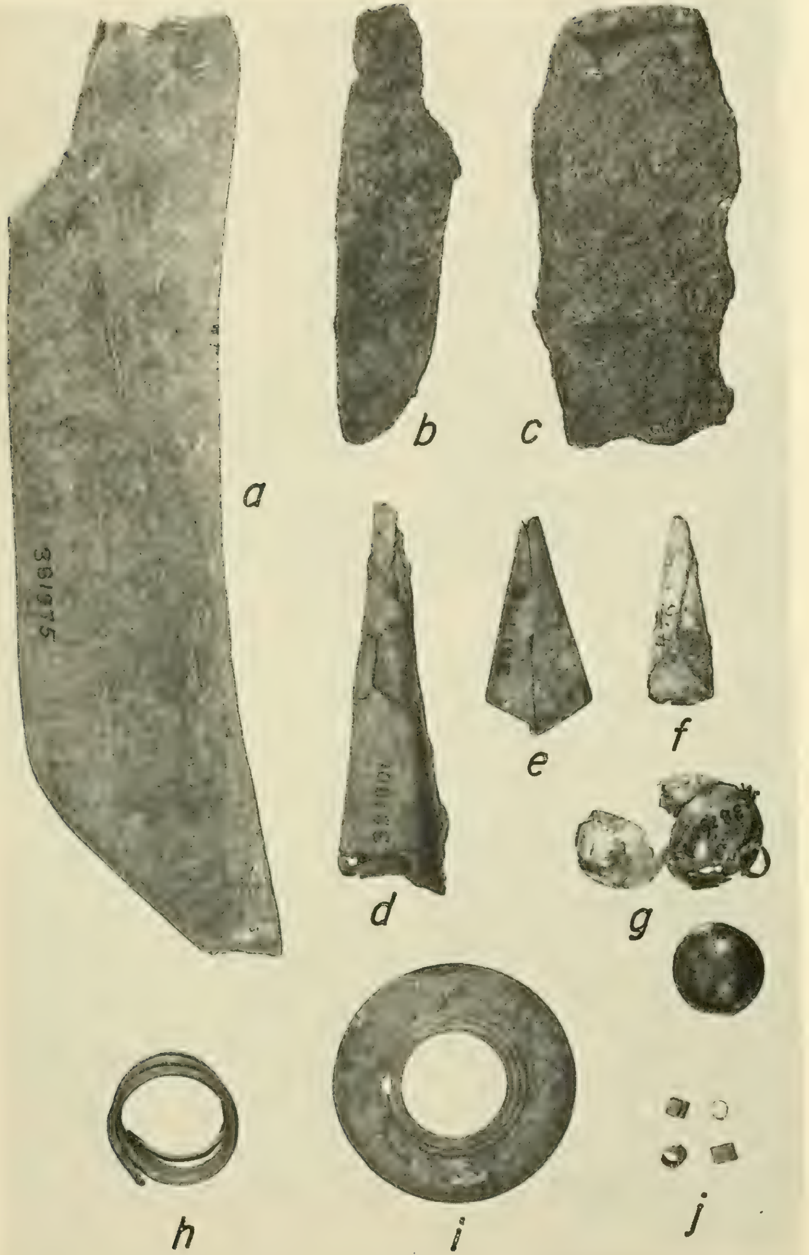
Trailed potsherds and miniature bowl, Fanning site.



Rimsherds of Lower Loup Focus types, Fanning site.


444
a
b
c
d
e
f
g
h
i
j
566
k
l
m
0
1
ONE INCH
n
o
p
q

Miscellaneous artifacts from Fanning site.


a
b
c
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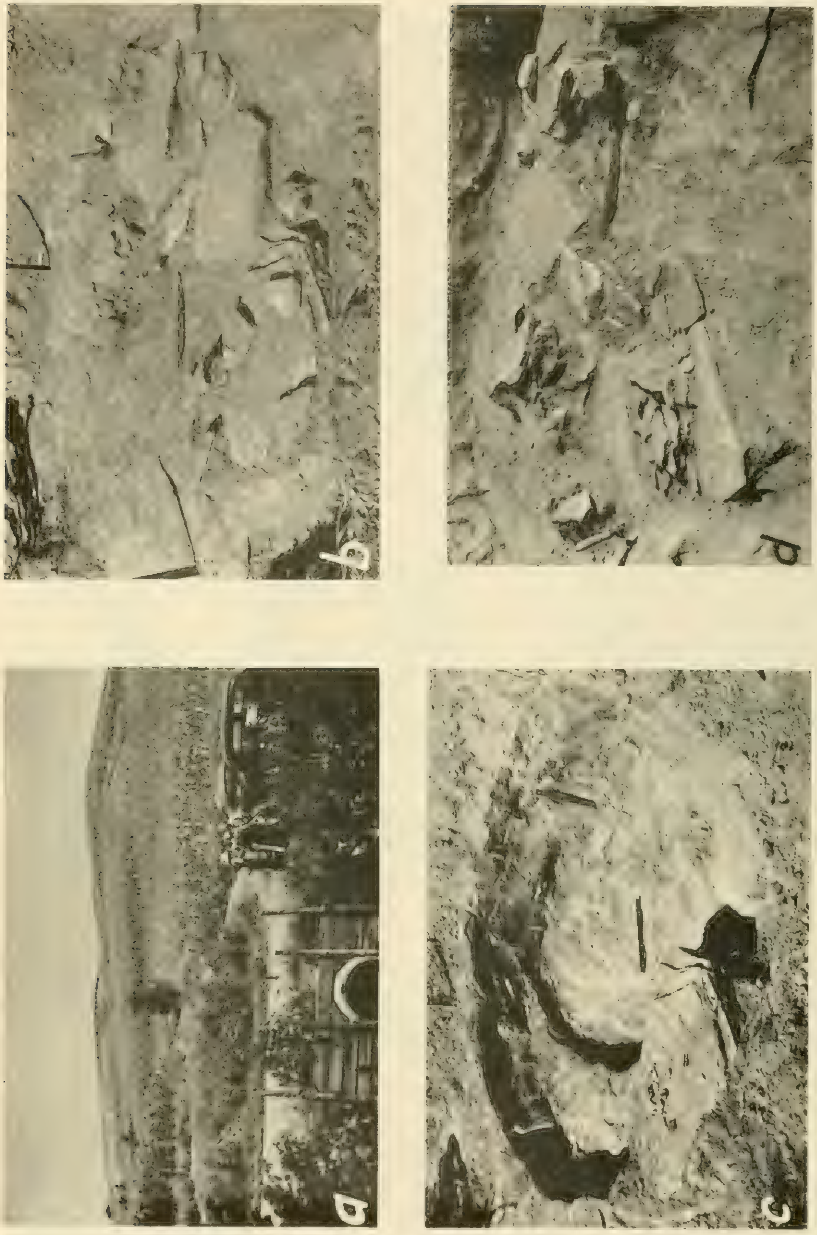
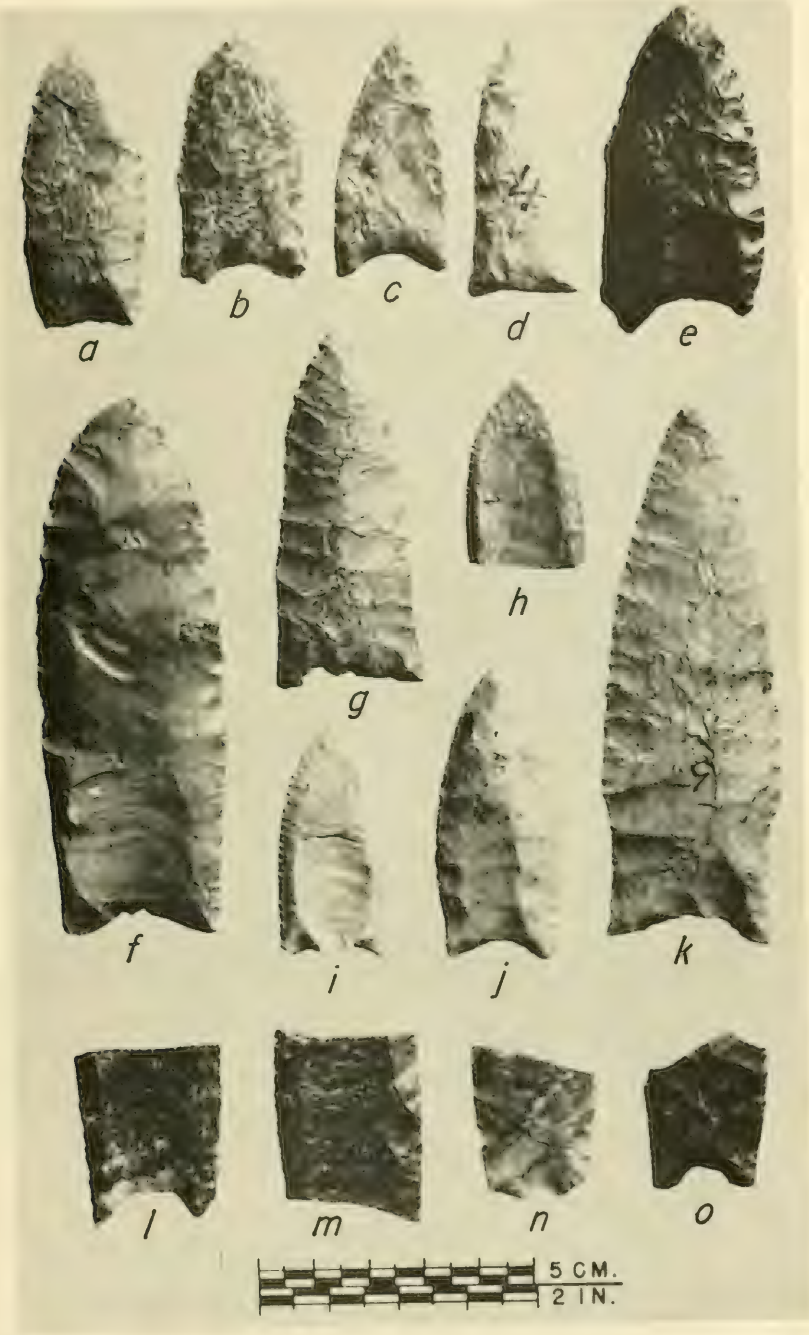
e
f
g
h
i
j
361975

Brass and iron (*b*, *c*) objects, Fanning site.



Burial mound excavations in Doniphan County.


a
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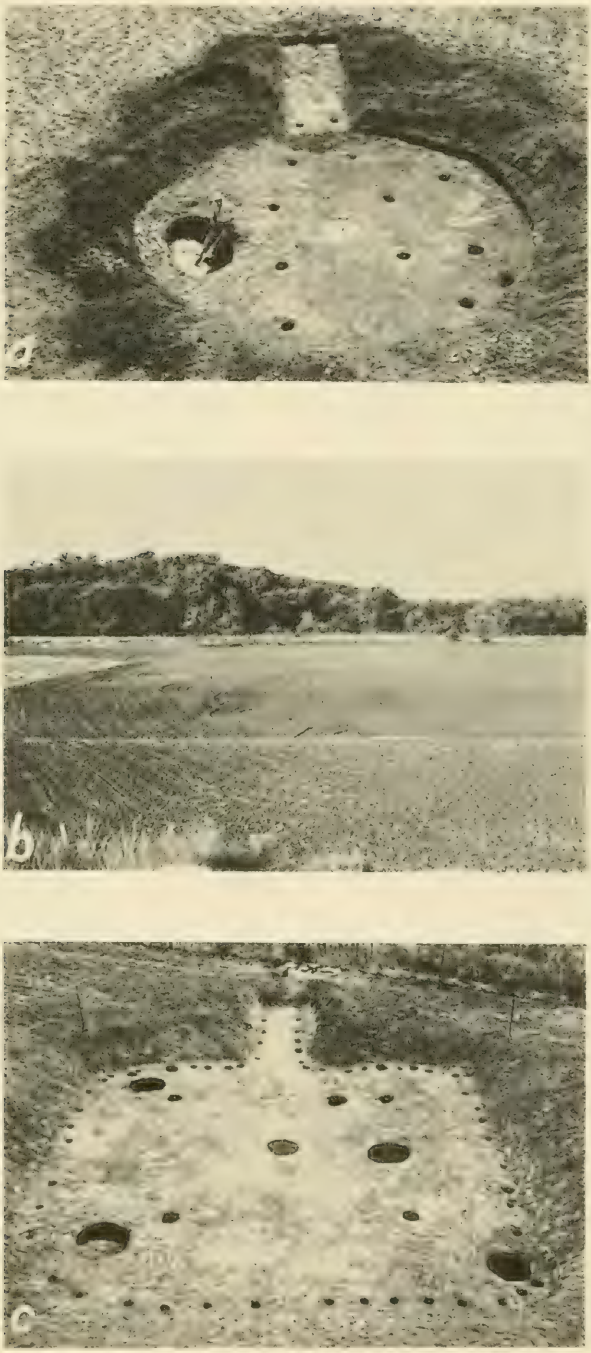
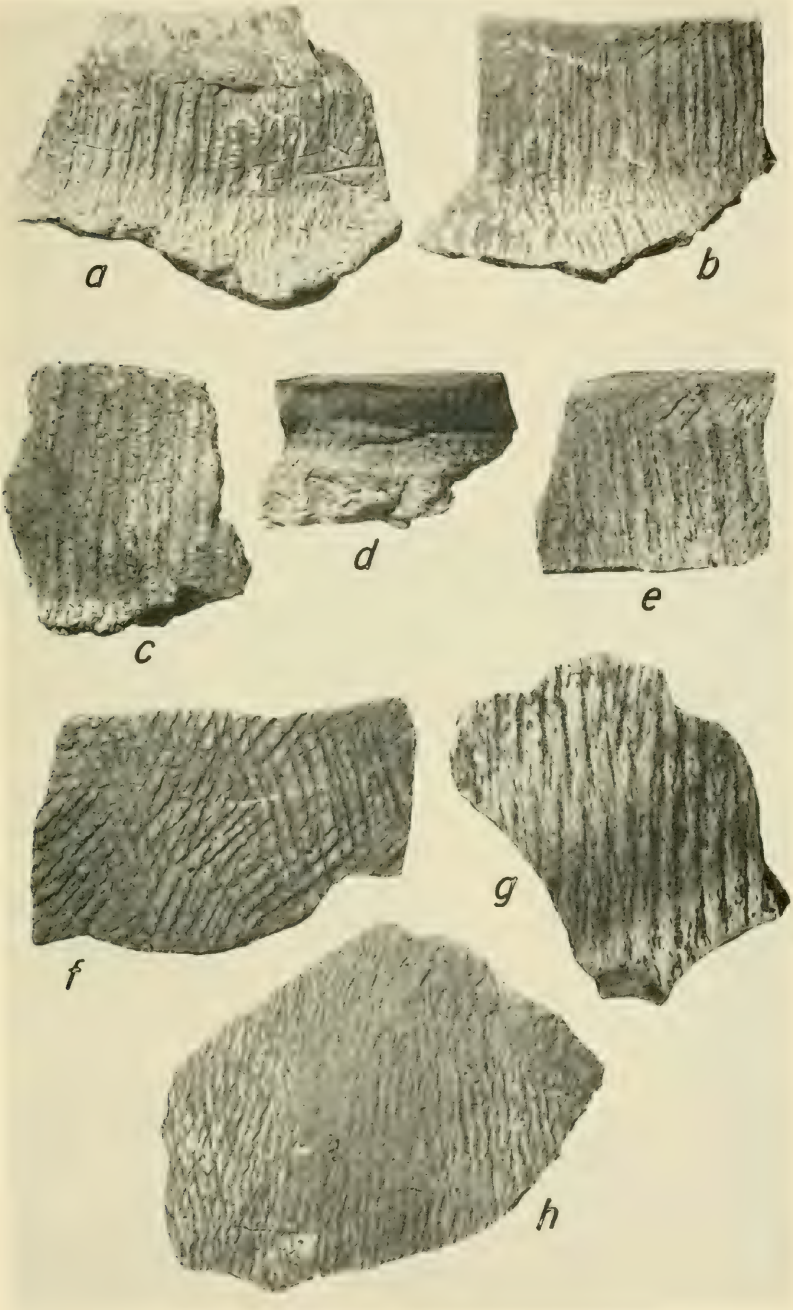
5 CM.
2 IN.

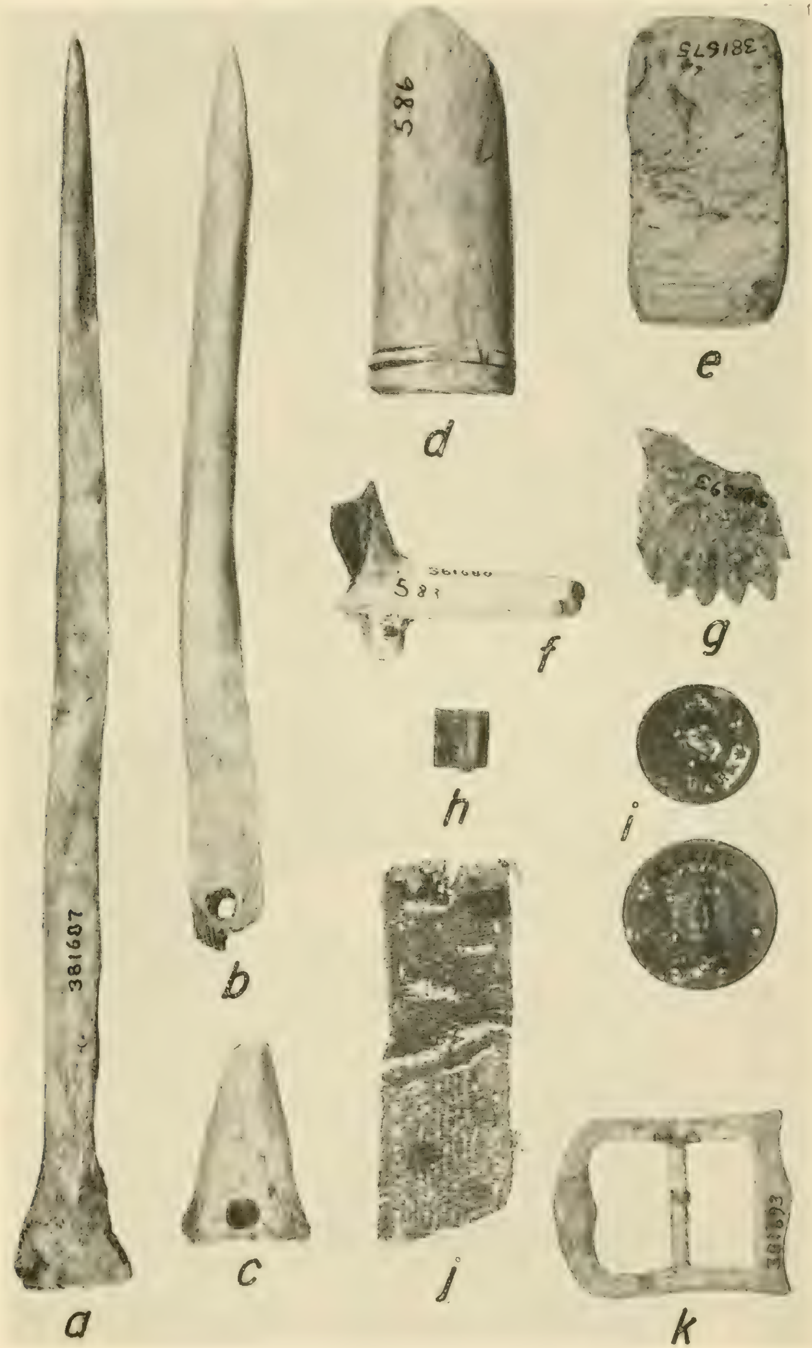
Surface finds of early-type projectile points from Doniphan and Seward Counties, Kans.



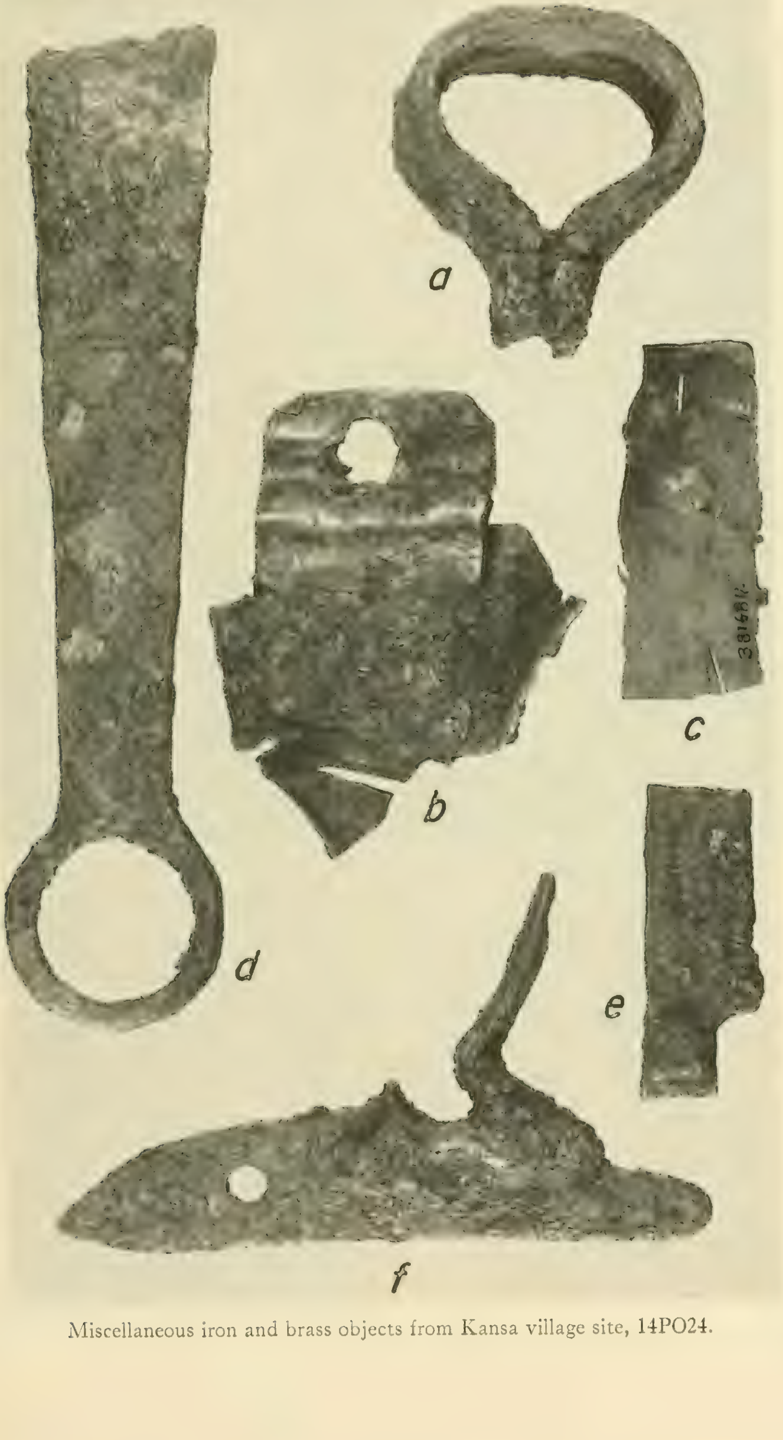
Excavations near Manhattan.



Riley Cord-roughened potsherds from Griffing site.


a
381687
b
c
d
586
e
381675
f
381680
583
g
h
i
j
k
381693

Miscellaneous objects from Kansa village site, 14PO24.


a
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381684
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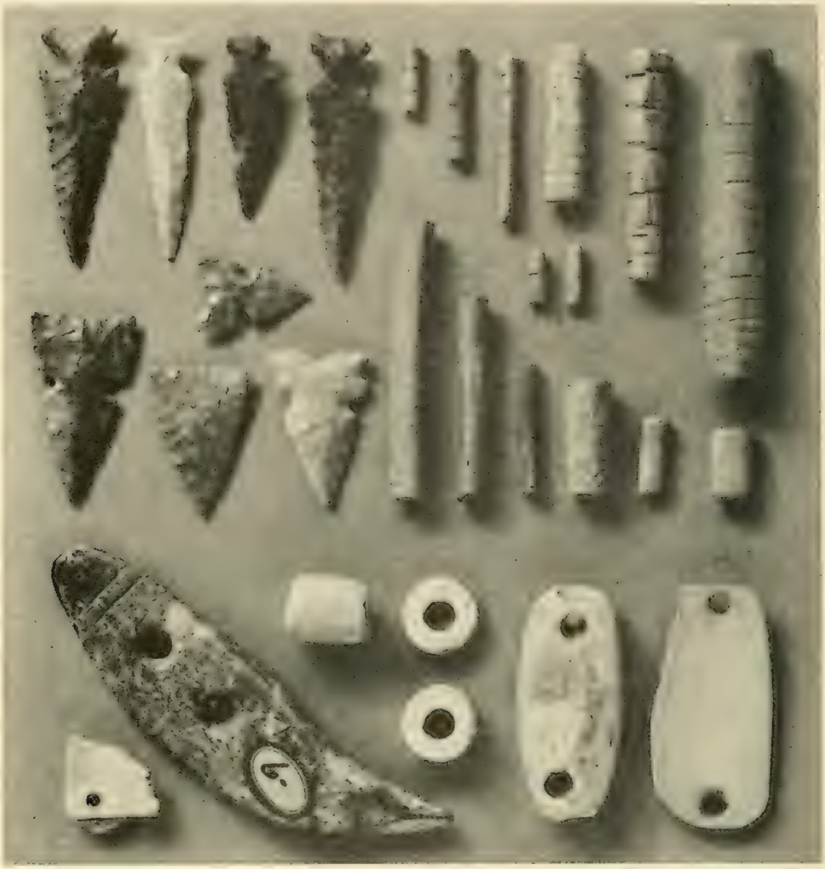
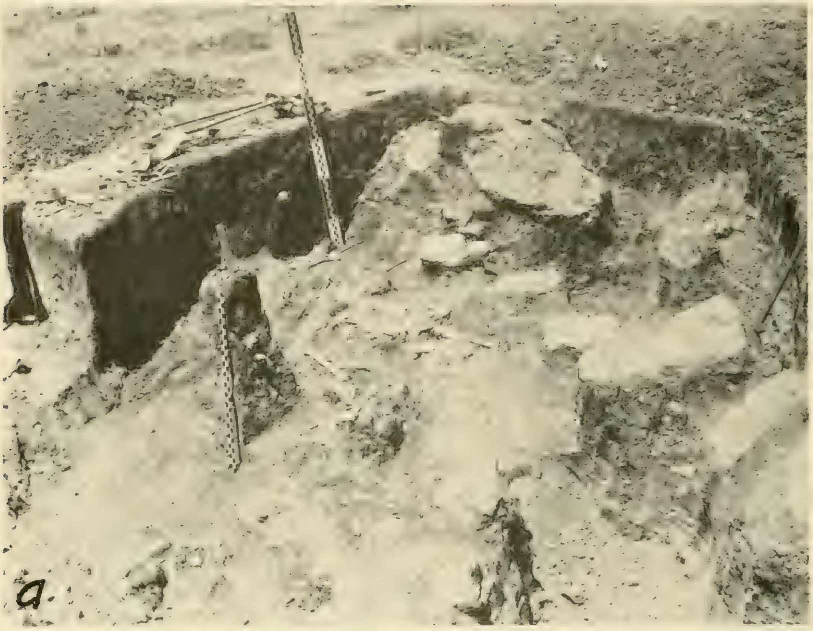
e
f

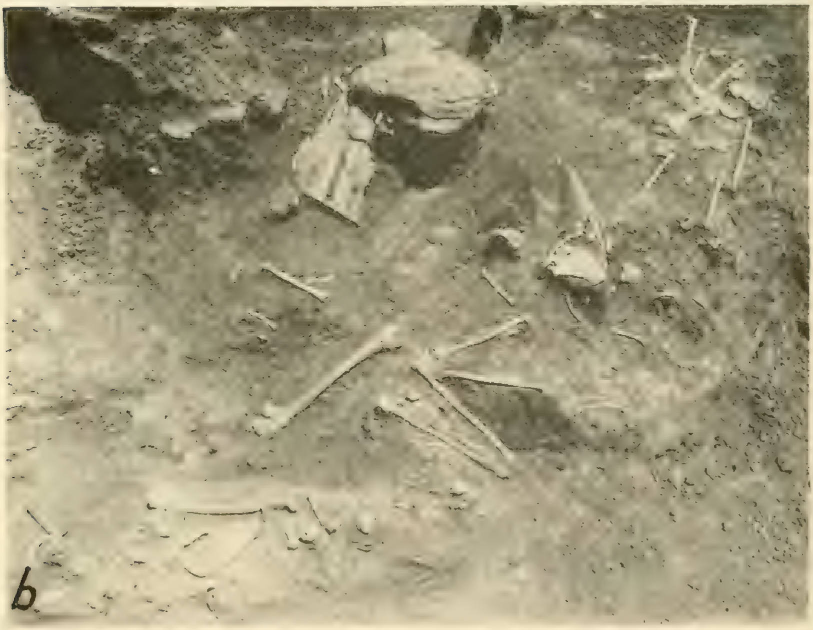
Miscellaneous iron and brass objects from Kansa village site, 14PO24.



Stone, bone, and shell objects from burial mounds near Manhattan.

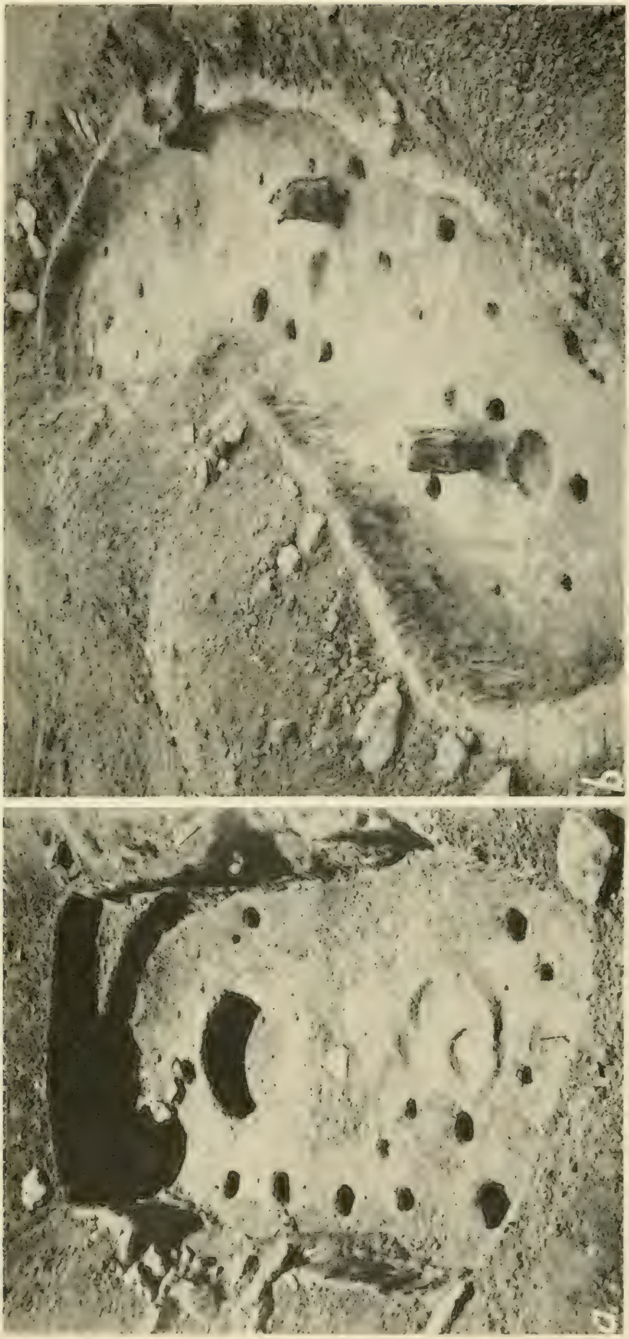
Tobias site (14RC8), Rice County.



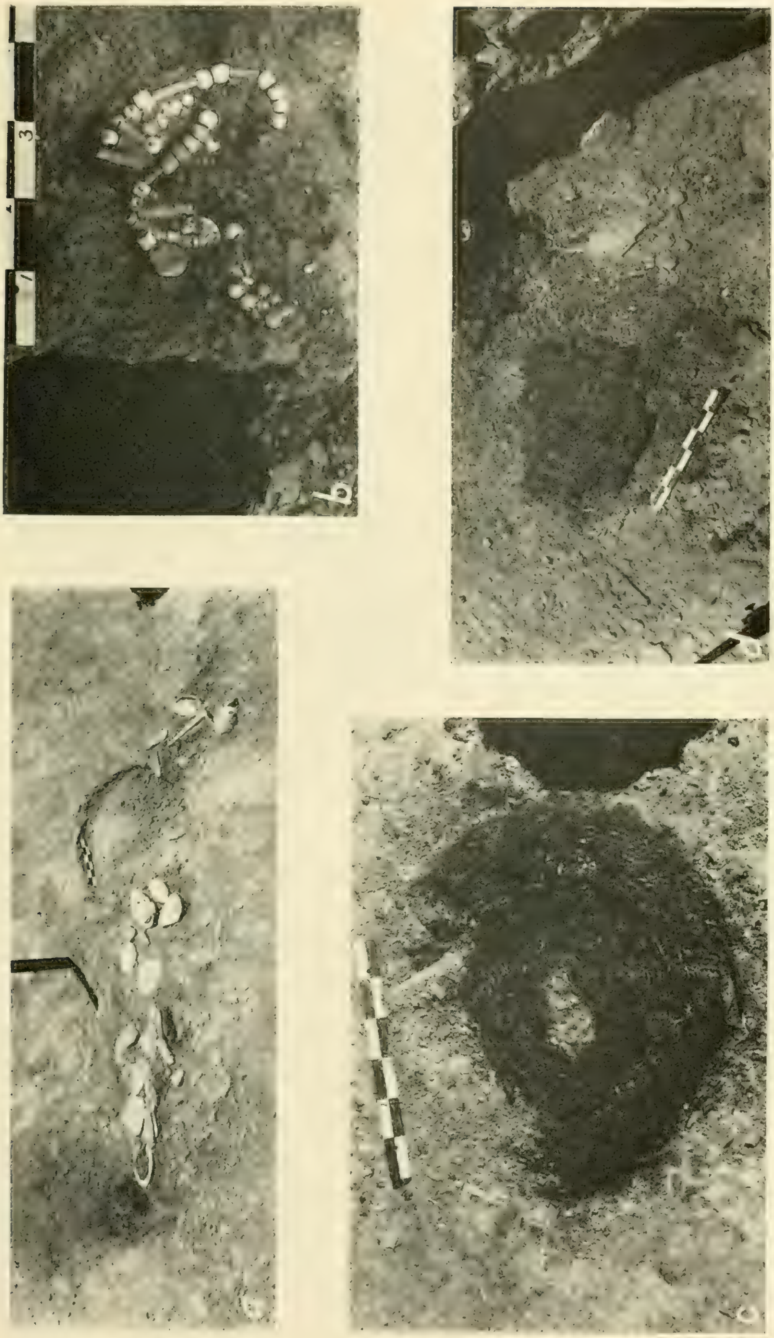


Excavations at Tobias site, Rice County.

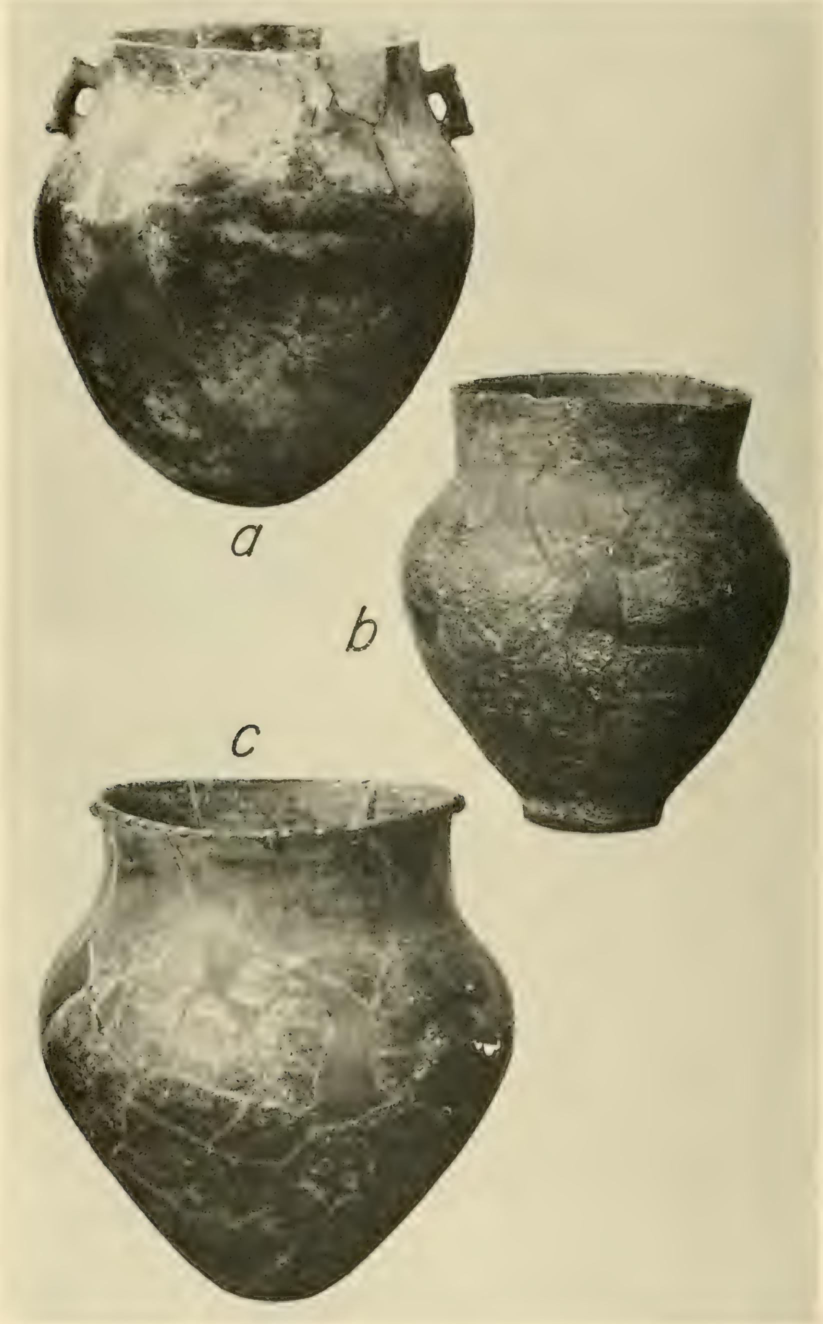
Excavations at Tobias site, Rice County.



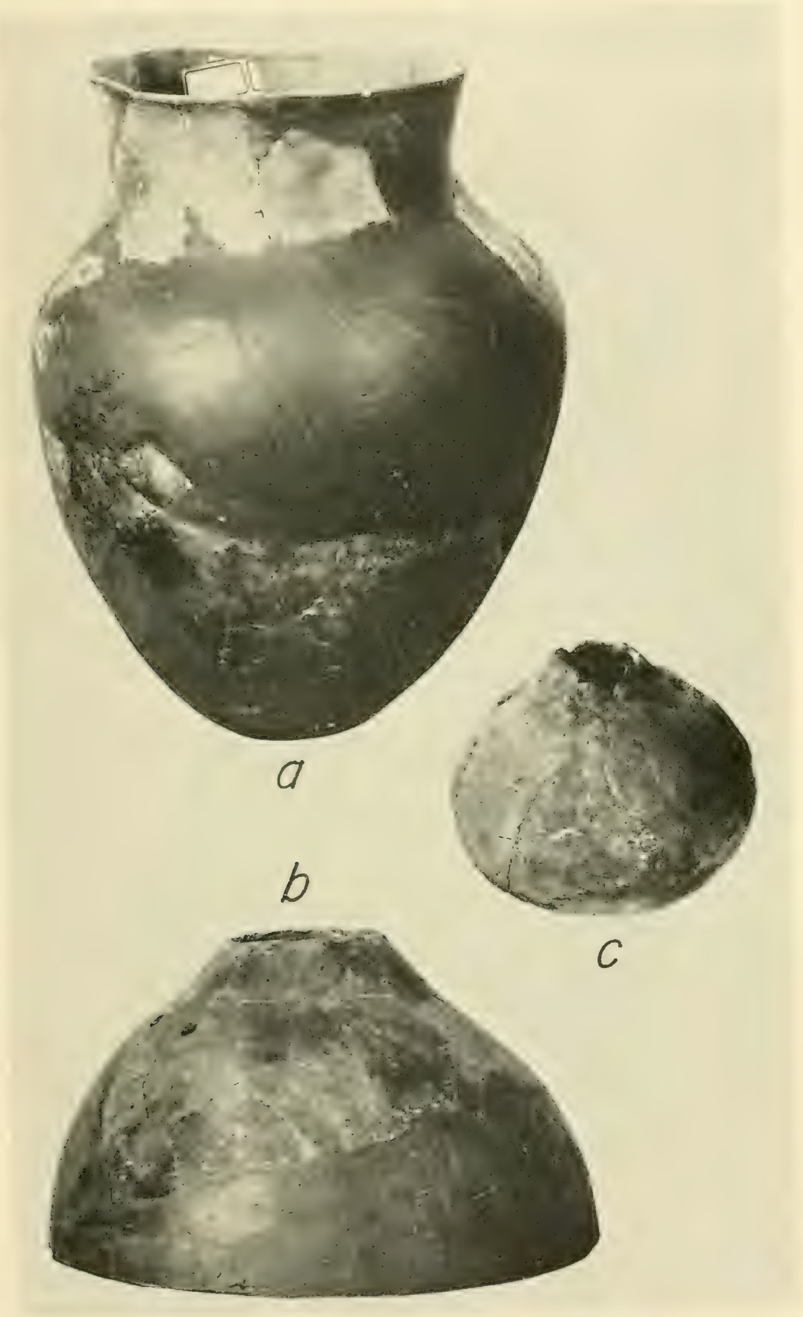
Excavations at Tobias site, Rice County.



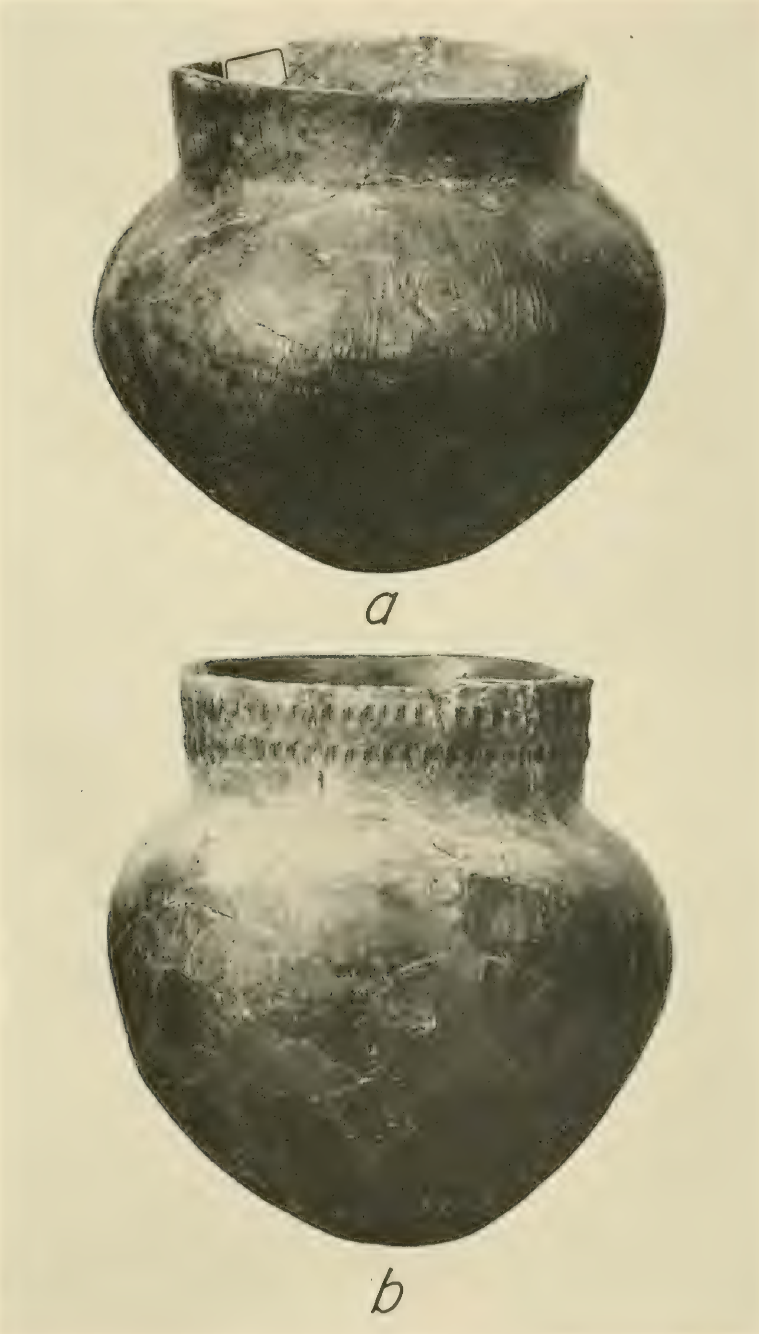
Miscellaneous features in mound 17 complex, Tobias site.



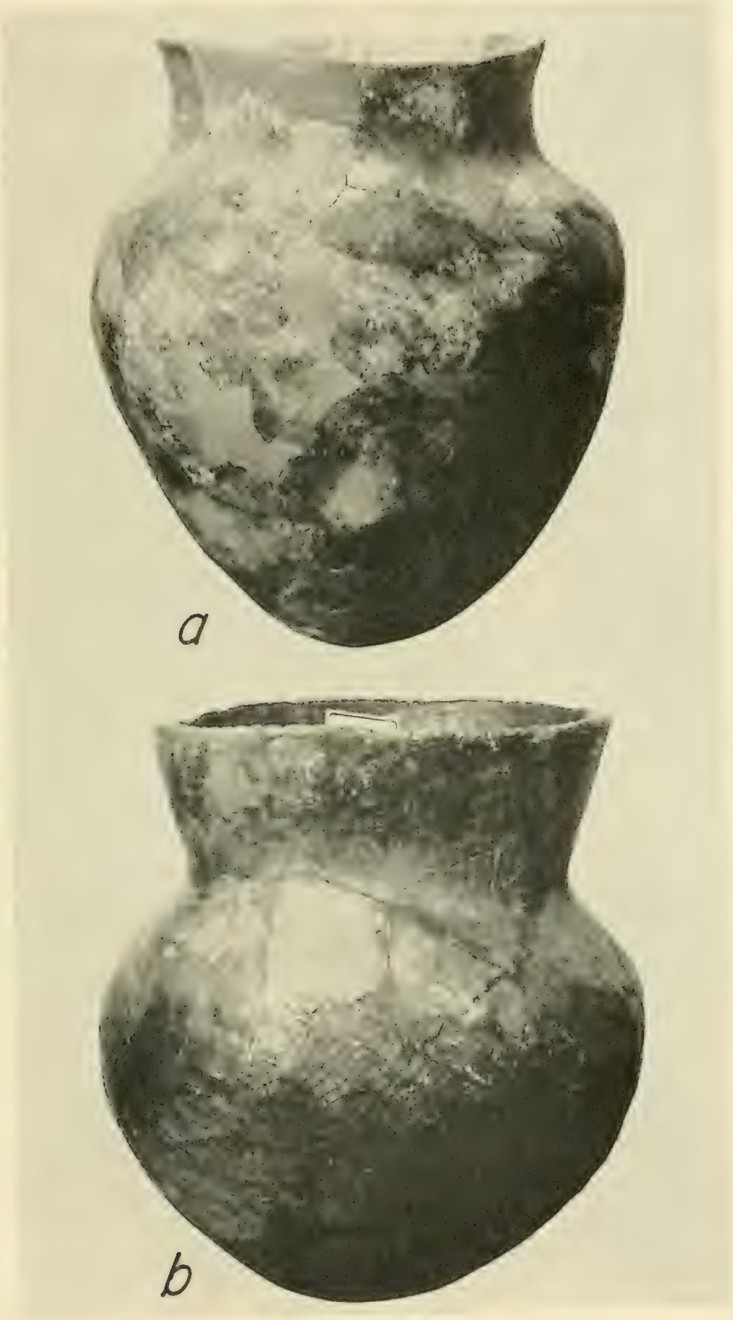
Restored pottery vessels of type Genesco Plain, from Tobias site, Rice County.



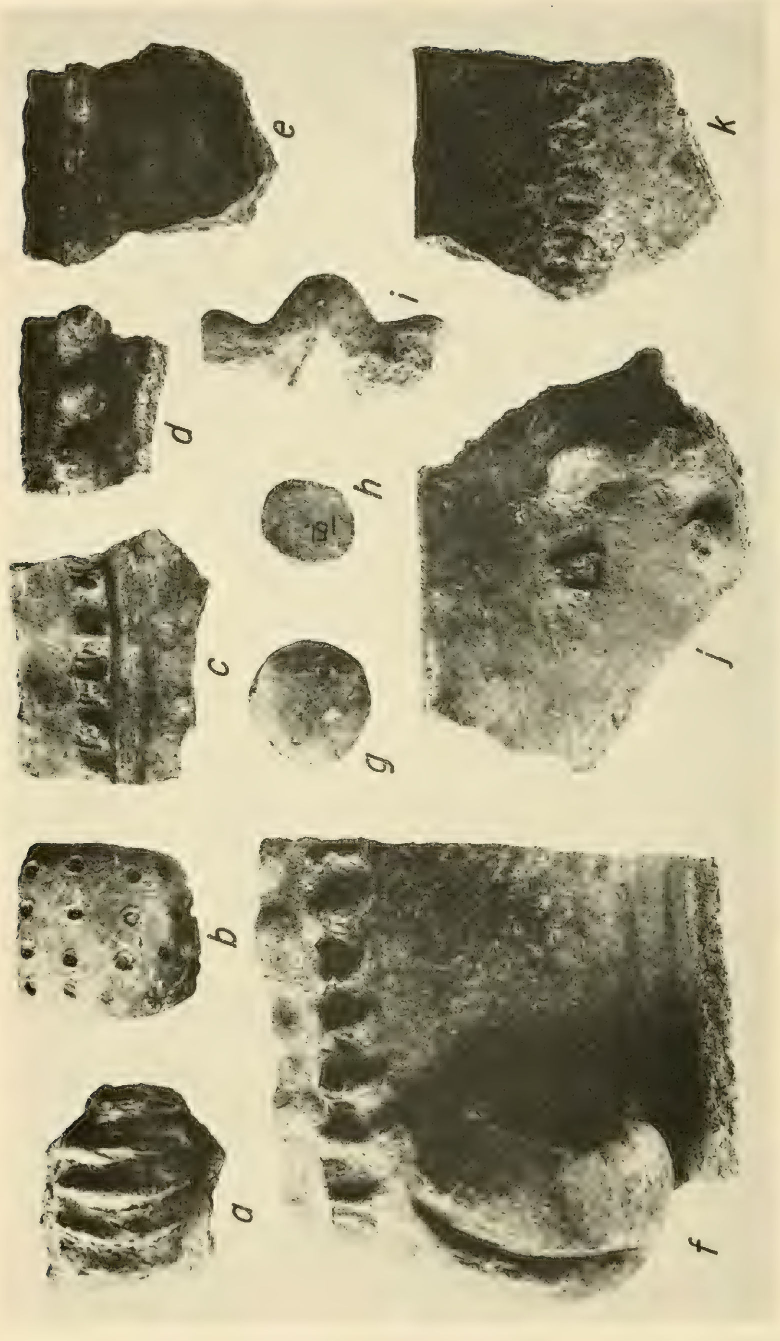
Restored pottery vessels from Tobias site, Rice County.



Restored pottery vessels, type Geneseo Simple Stamped, from Tobias site, Rice County.



Restored pottery vessels from Tobias site, Rice County.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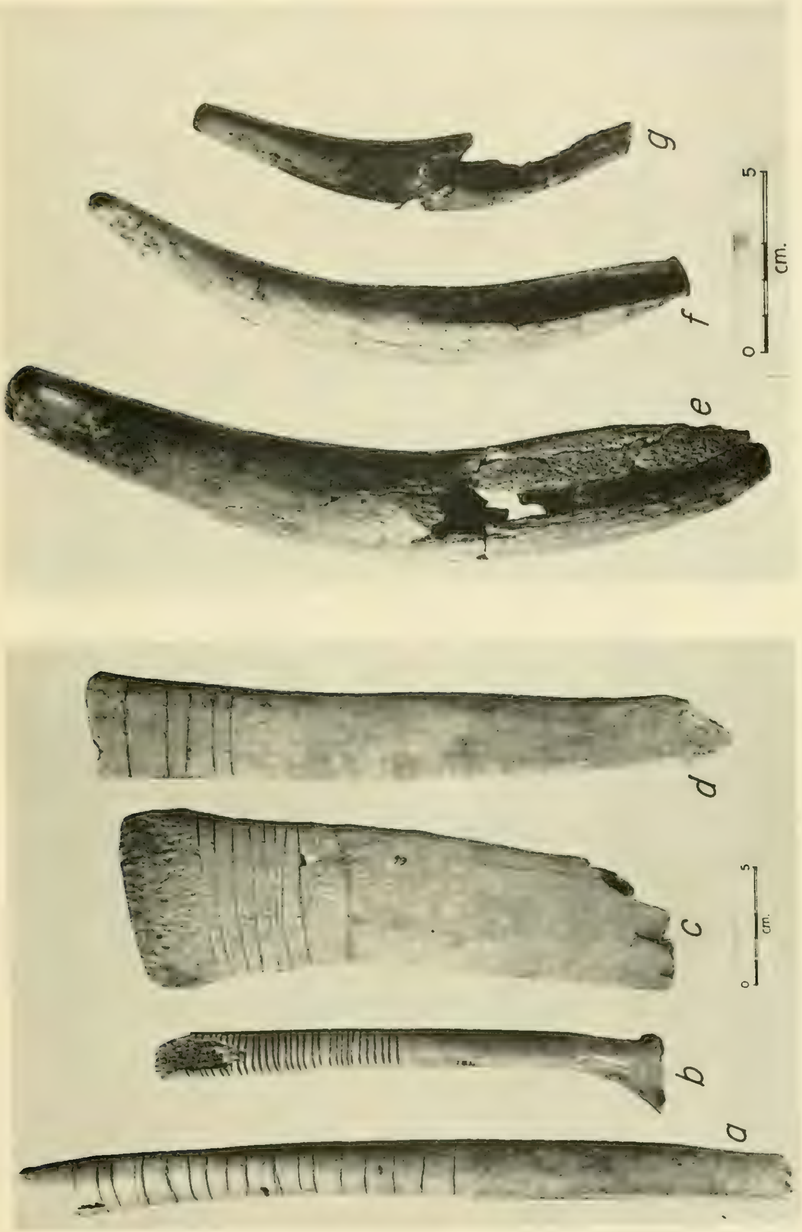
k

Rimsherds, handles, and sherd disks from Tobias site, Rice County.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cm.
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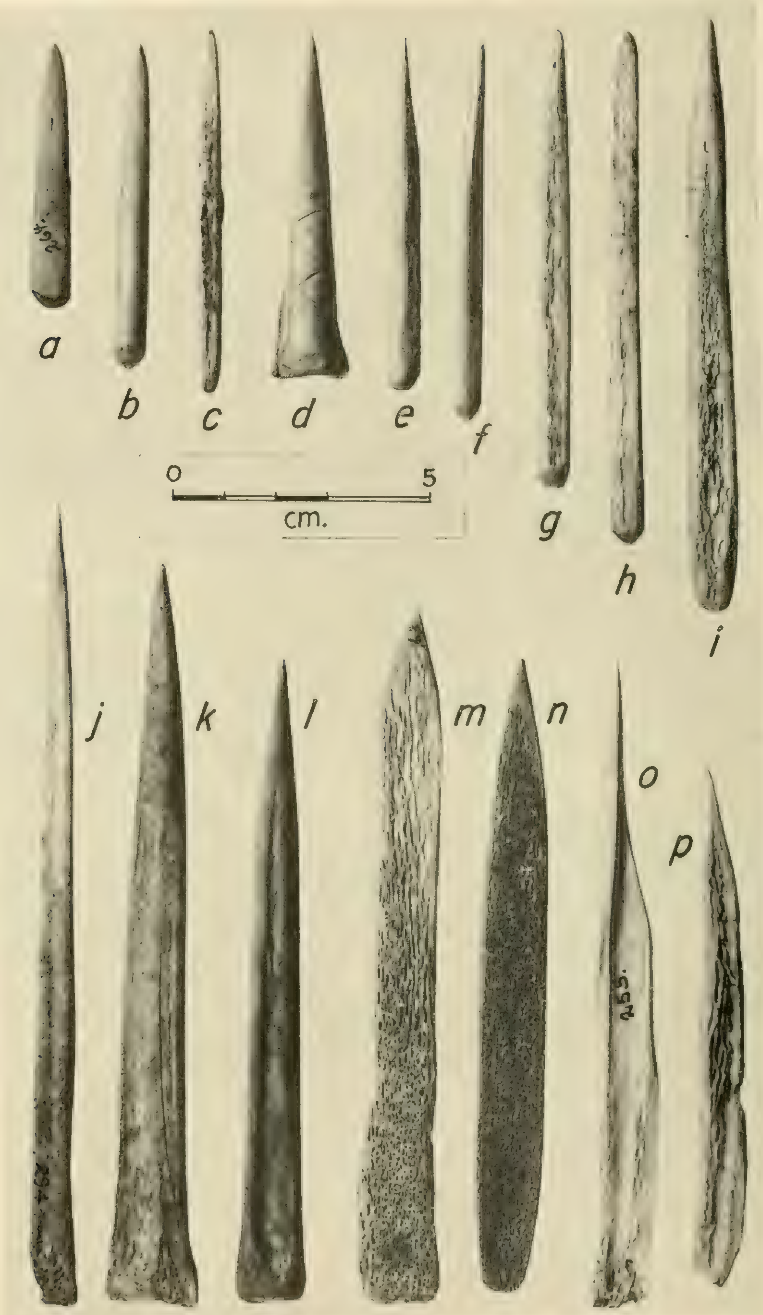
0
cm.
5

Bone and antler implements from Tobias and Malone (*c*) sites, Rice County.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cm.
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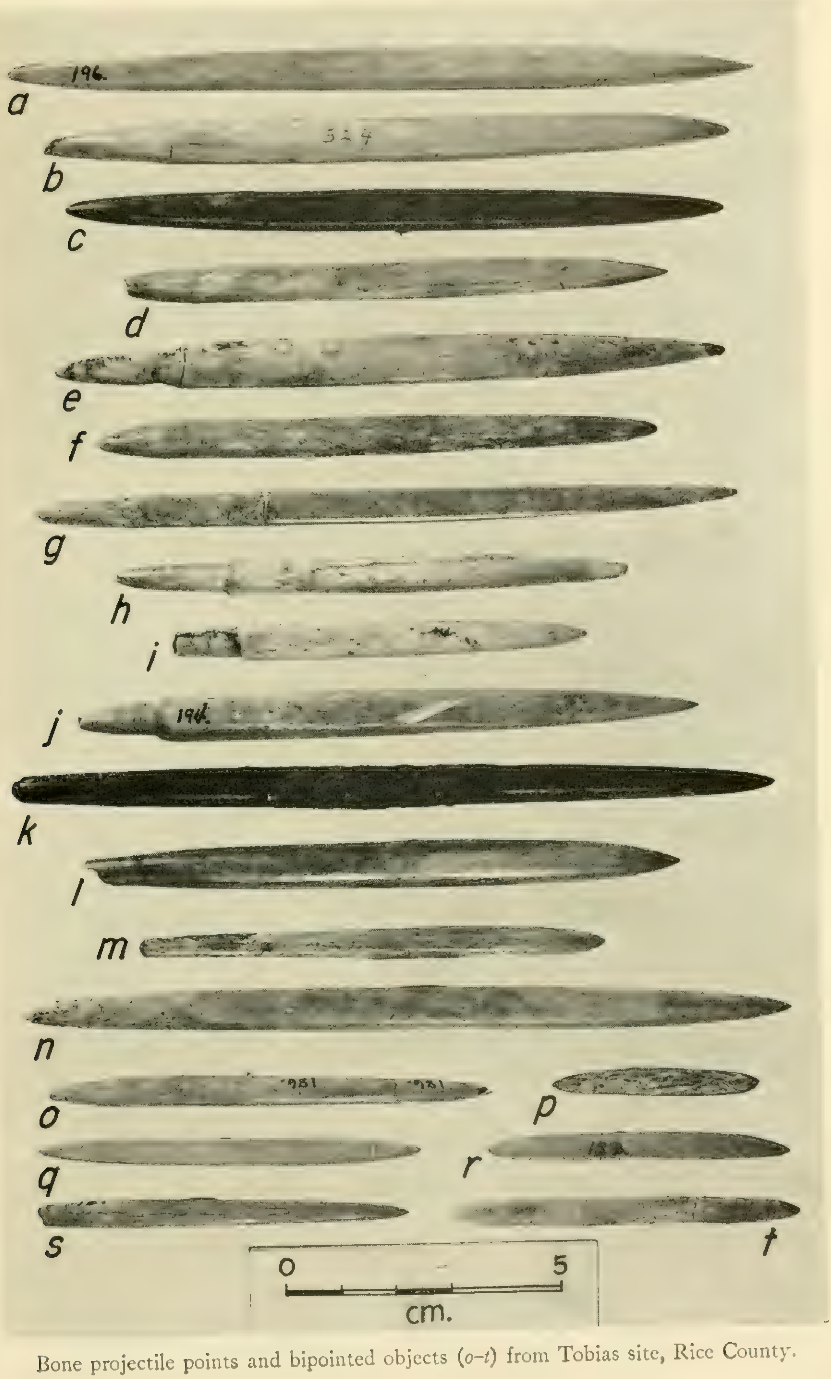
254.
255.
294

Bone awls and polishing(?) tools from various Little River Focus sites in Rice County.


196
a
524
b
c
d
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g
h
i
196
j
k
l
m
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981
981
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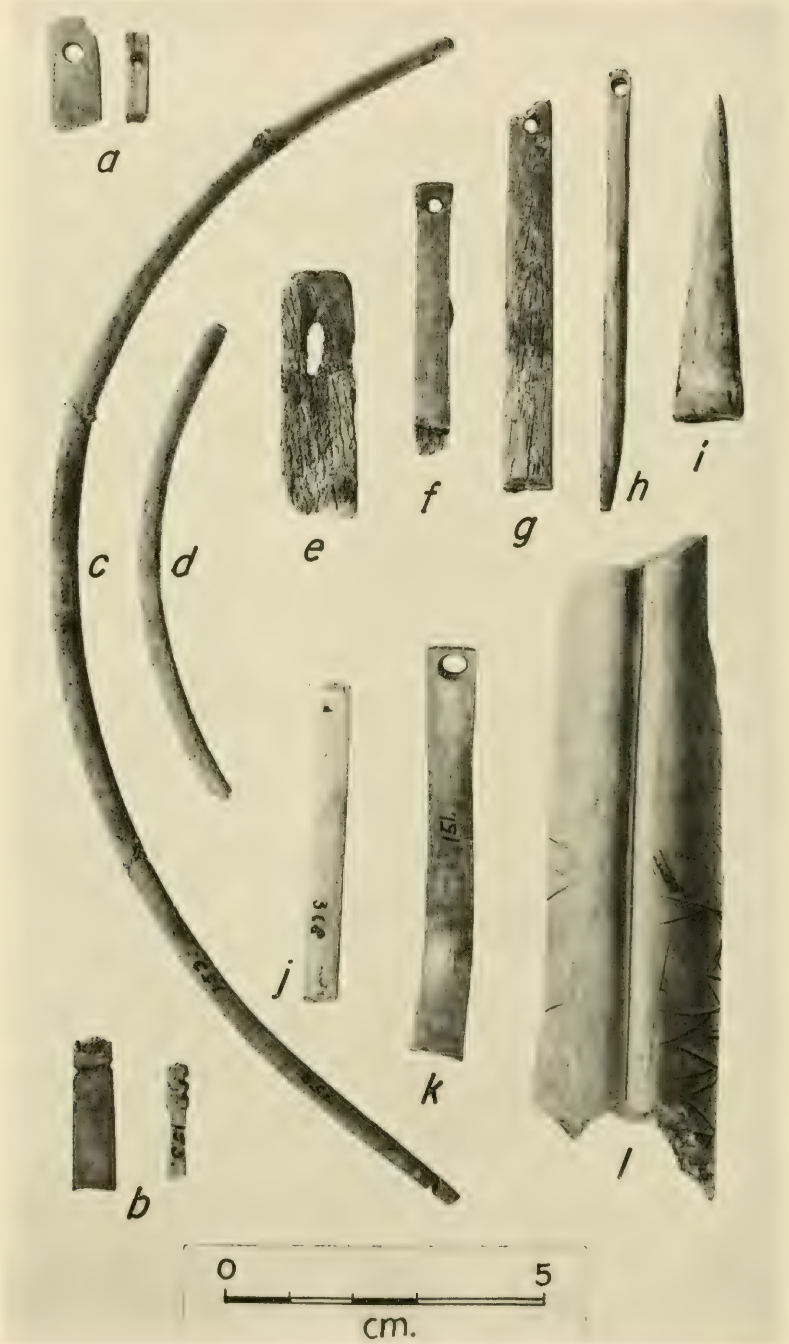
Bone projectile points and bipointed objects (*o–t*) from Tobias site, Rice County.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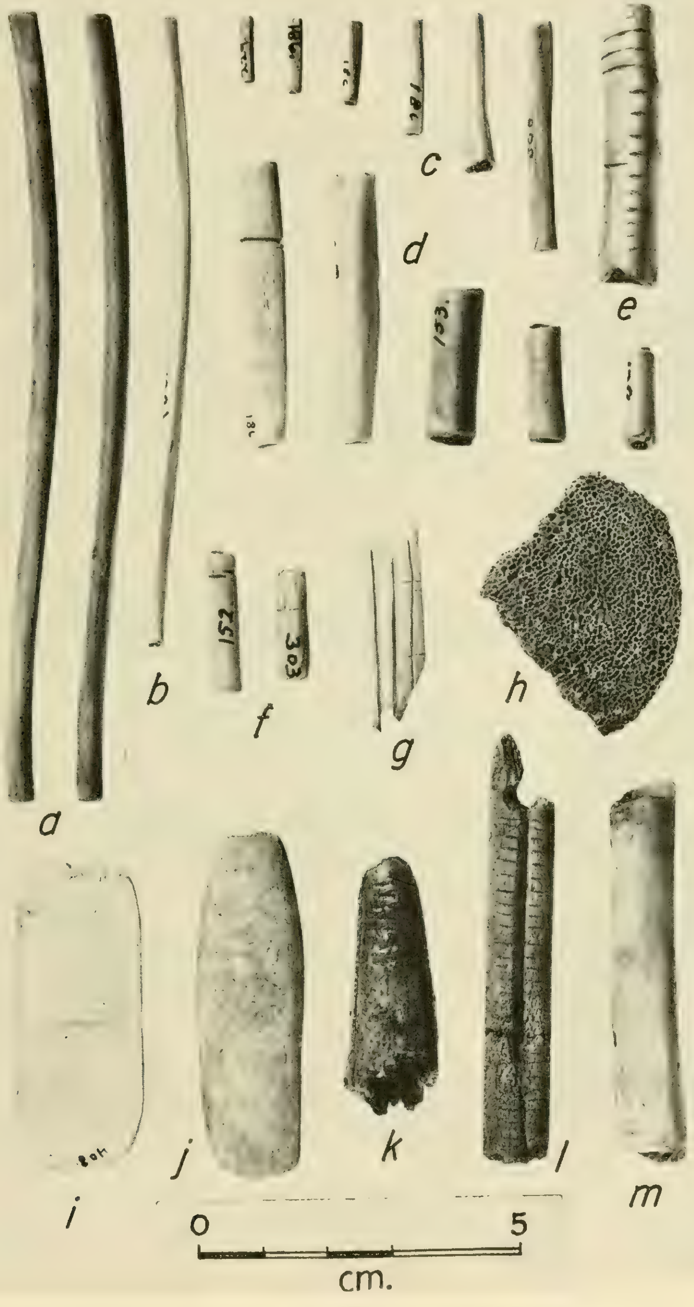
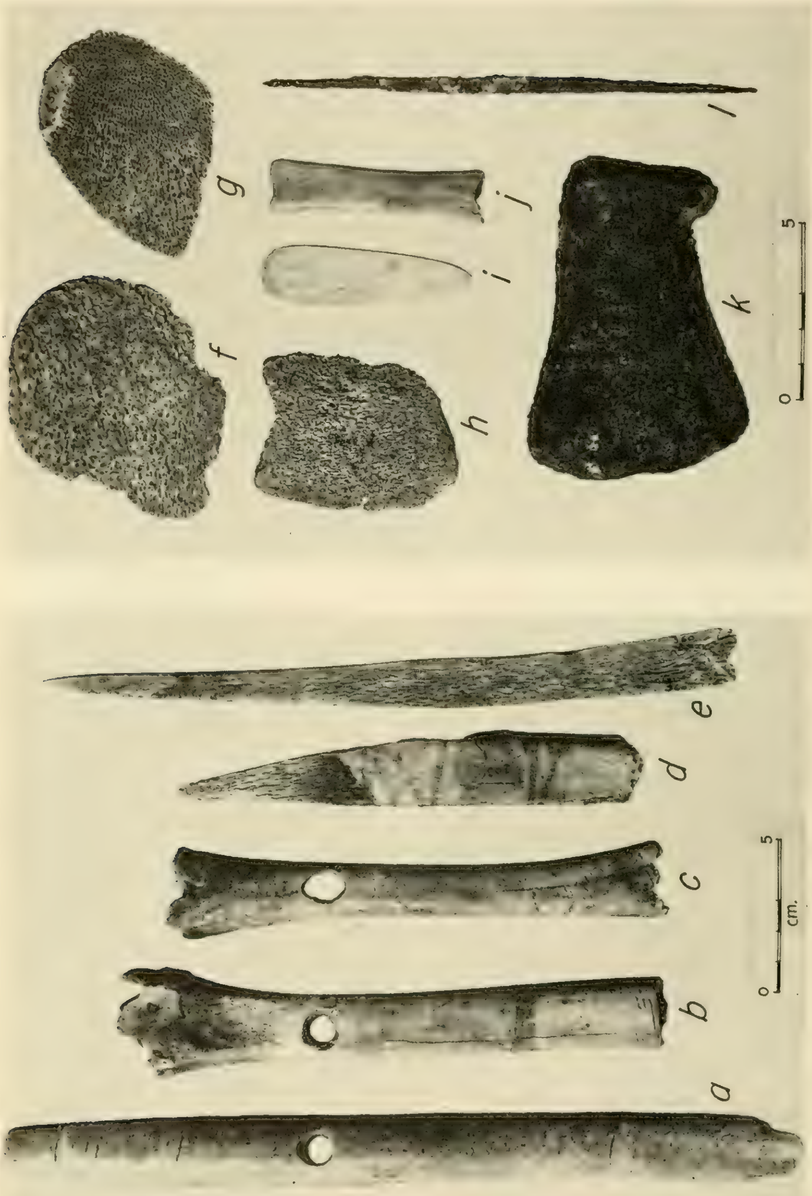
cm.

Worked antler strips and fragments, and cut mammal bone fragment (*l*), from Tobias site, Rice County.



Bone and antler artifacts from Tobias site, Rice County, and fragment of bone paint applicator (*h*) from Larcom-Haggard site, Cowley County.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l
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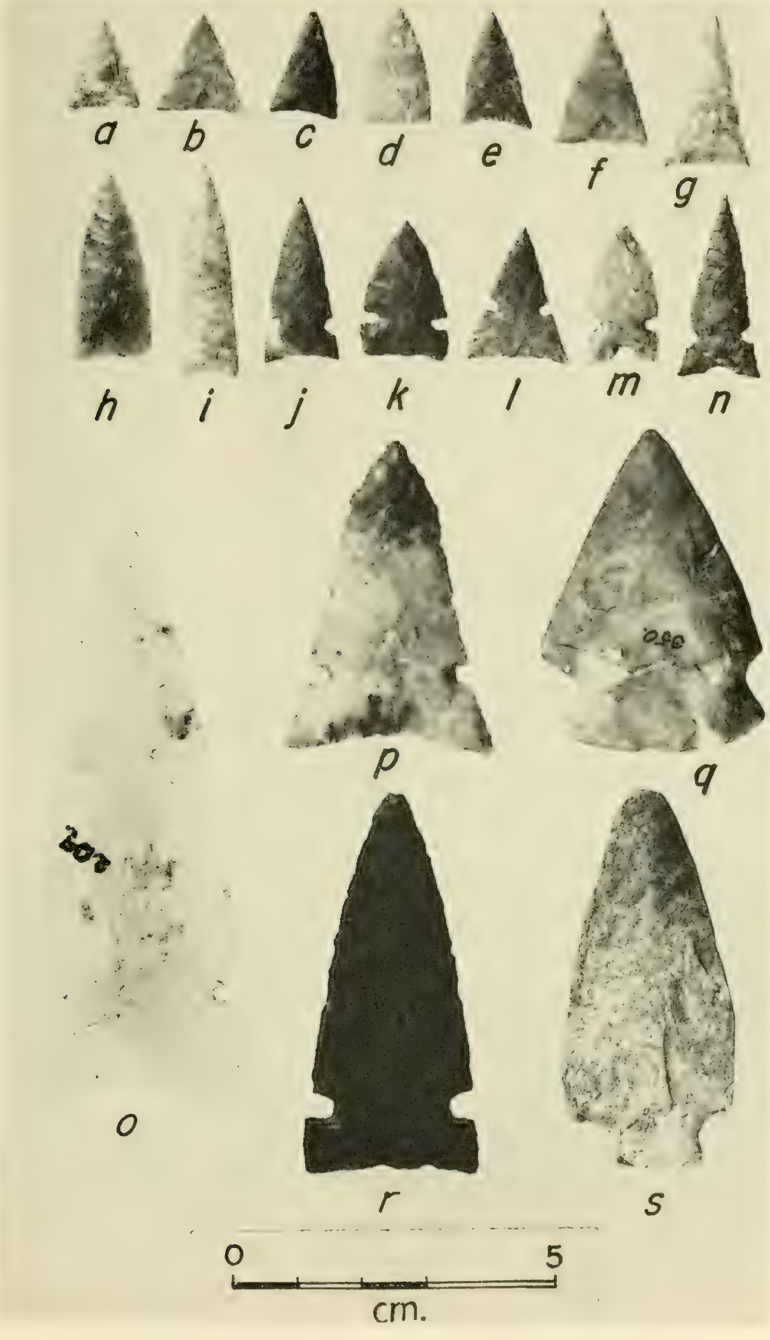
5

Bone and iron (*k*, *l*) objects from various Great Bend Aspect sites in Rice and Cowley (*b*, *c*) counties.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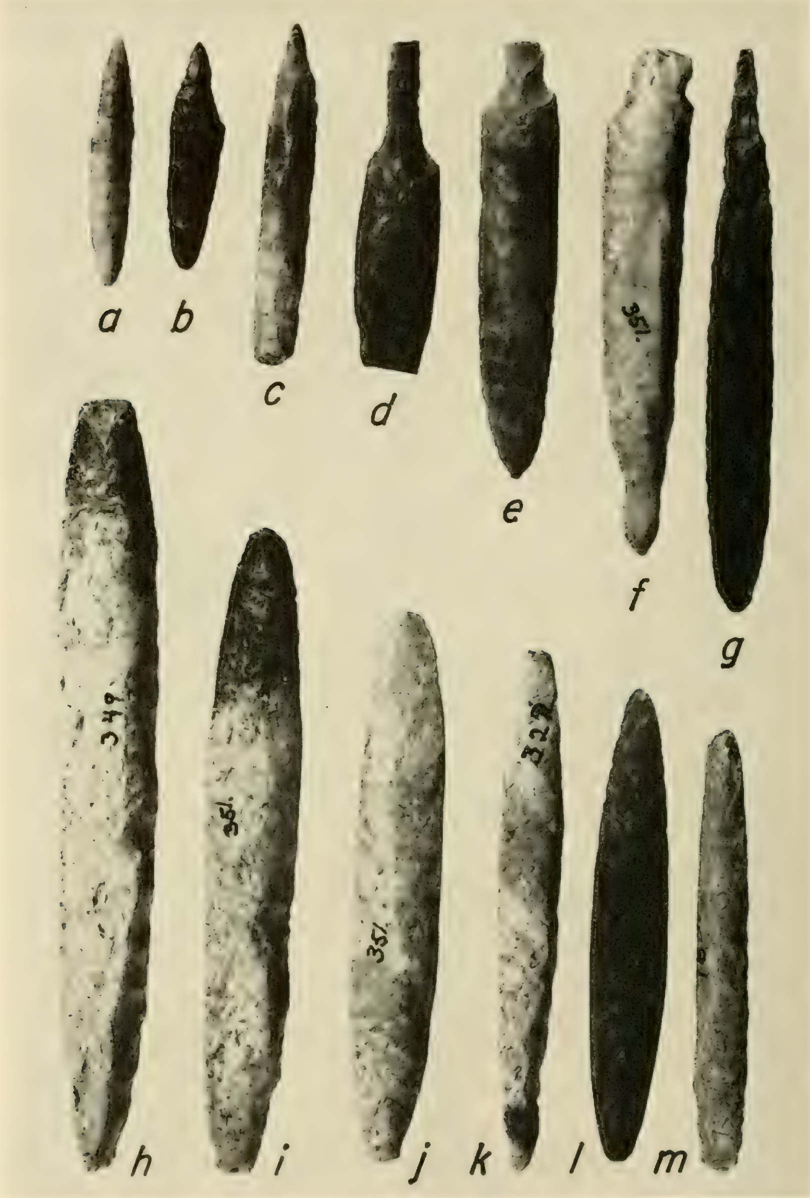
cm.

Chipped projectile points from Tobias site, Rice County.


a
b
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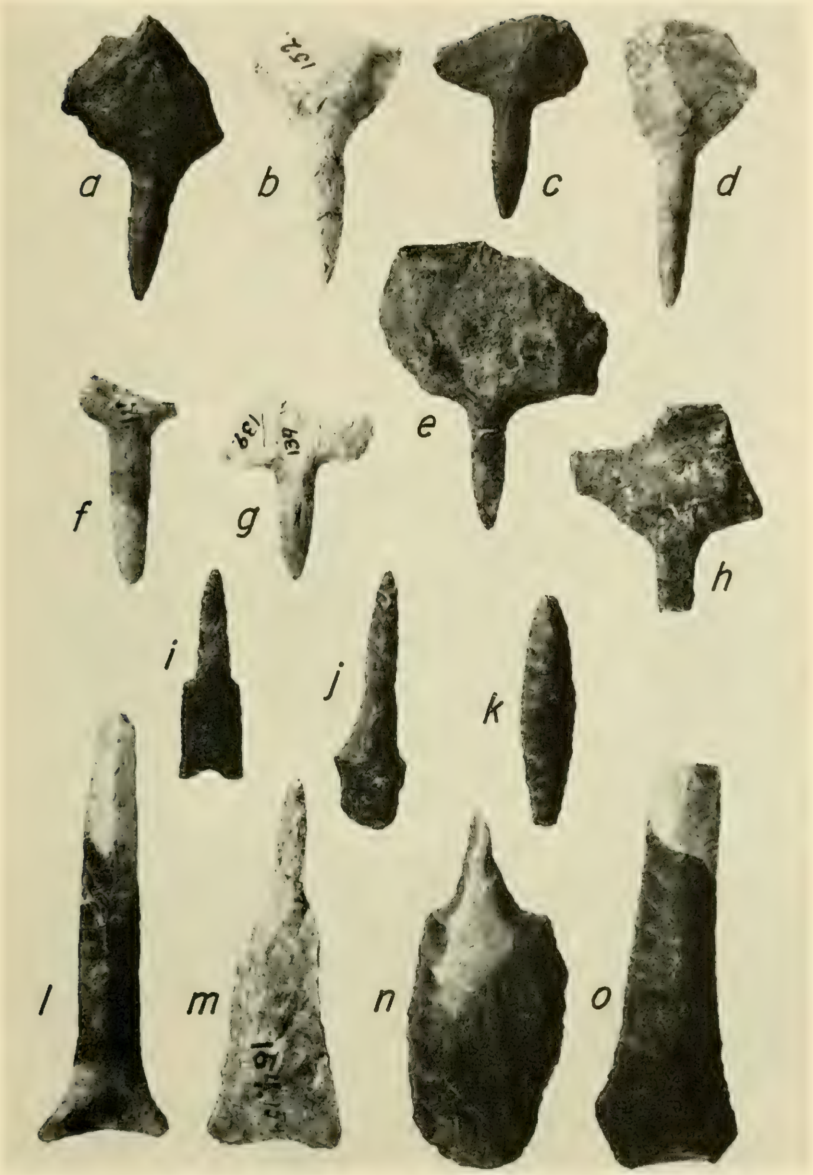
e
f
g
h
i
j
k
l
m
351.
349.
351.
351.
329

Stemmed (*b–g*) and plain-shafted (*h–m*) chipped drills from Tobias site, Rice County.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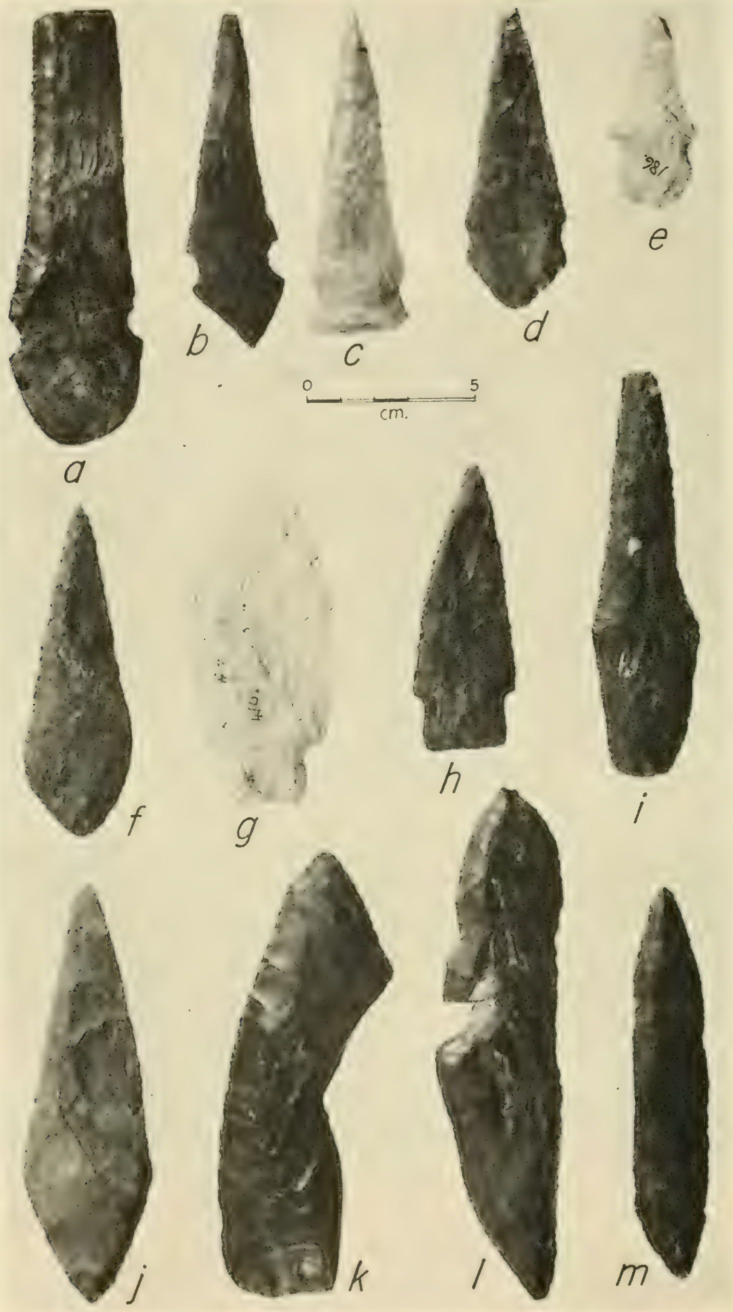
Expanded-base chipped drills from Tobias site, Rice County.


a
b
c
d
e
981
0
5
cm.
f
g
h
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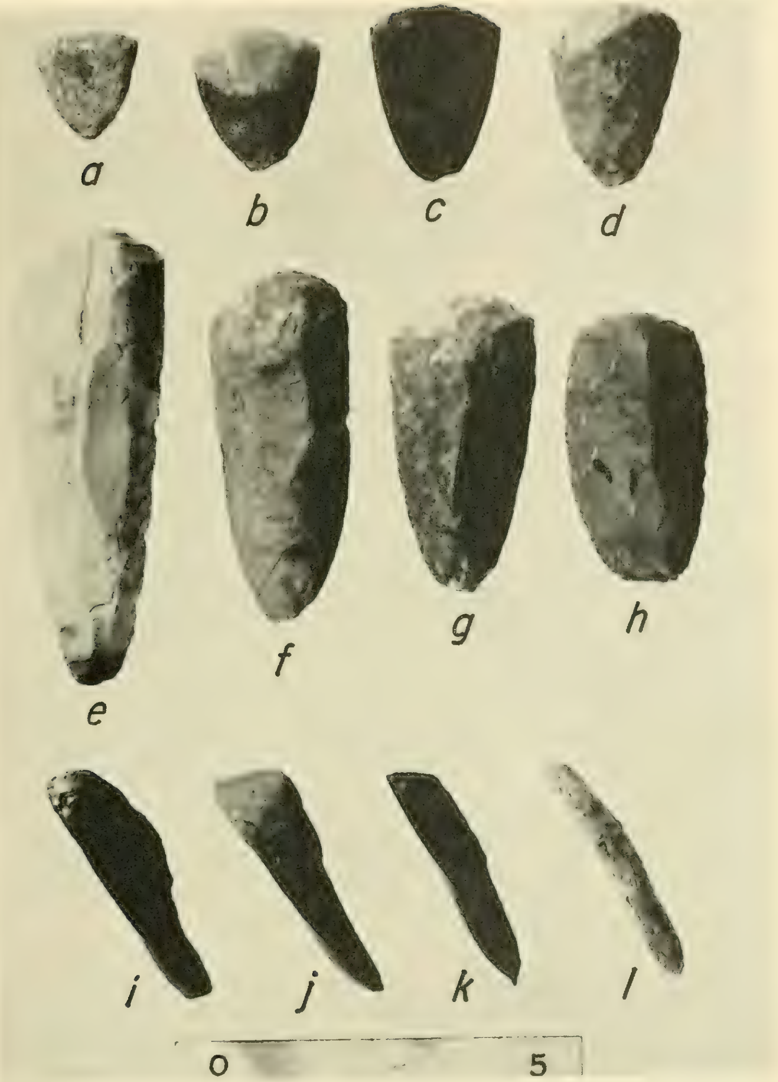
j
k
l
m

Chipped knives from Tobias and Thompson (*d*, *k*, *l*) sites, Rice County.


a
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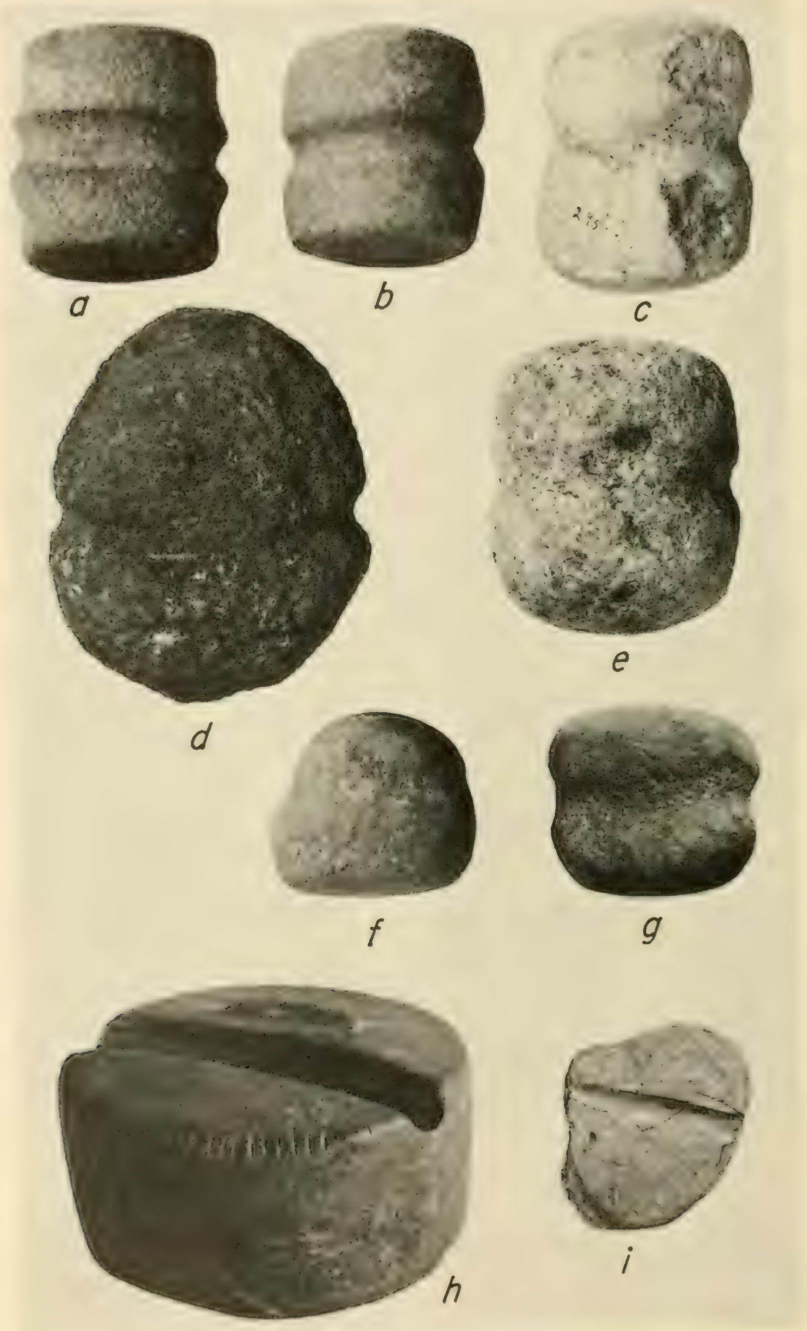
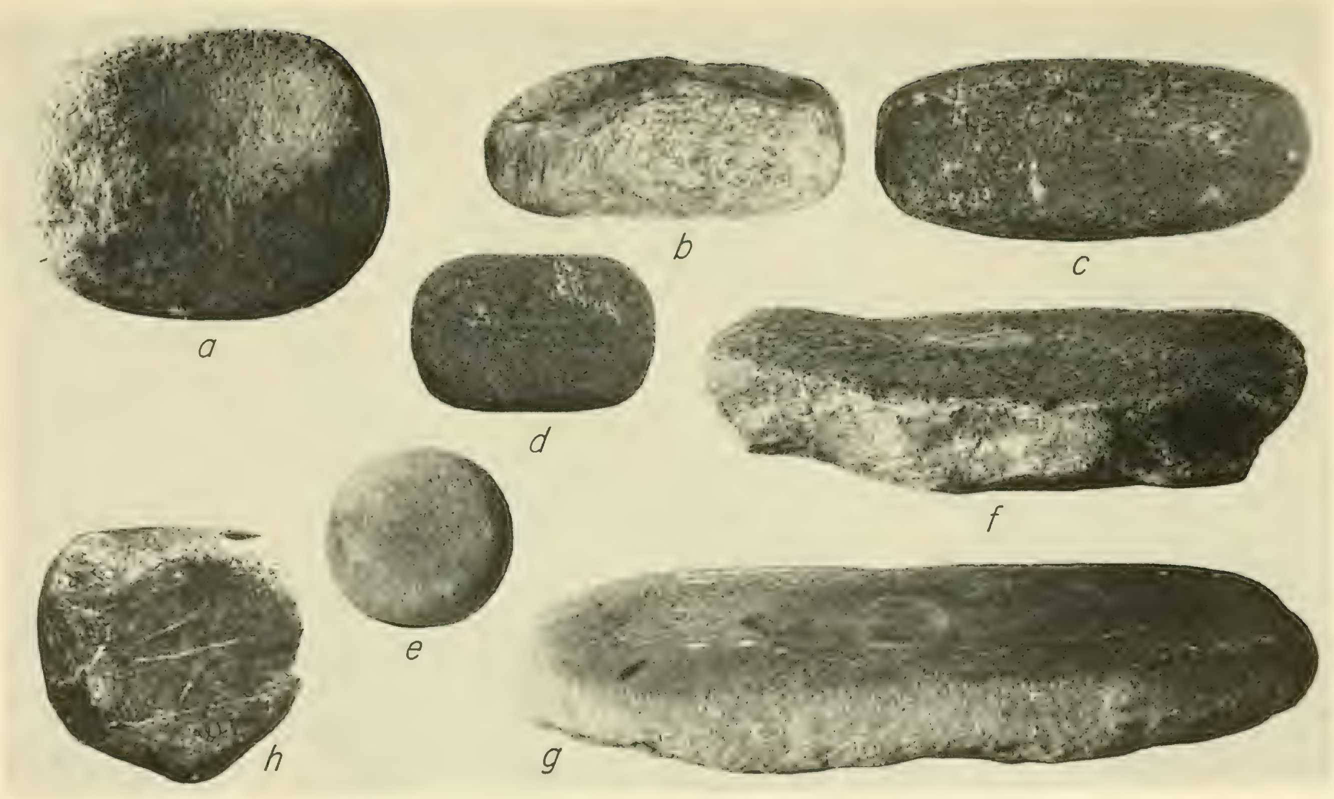
k
l
0
5

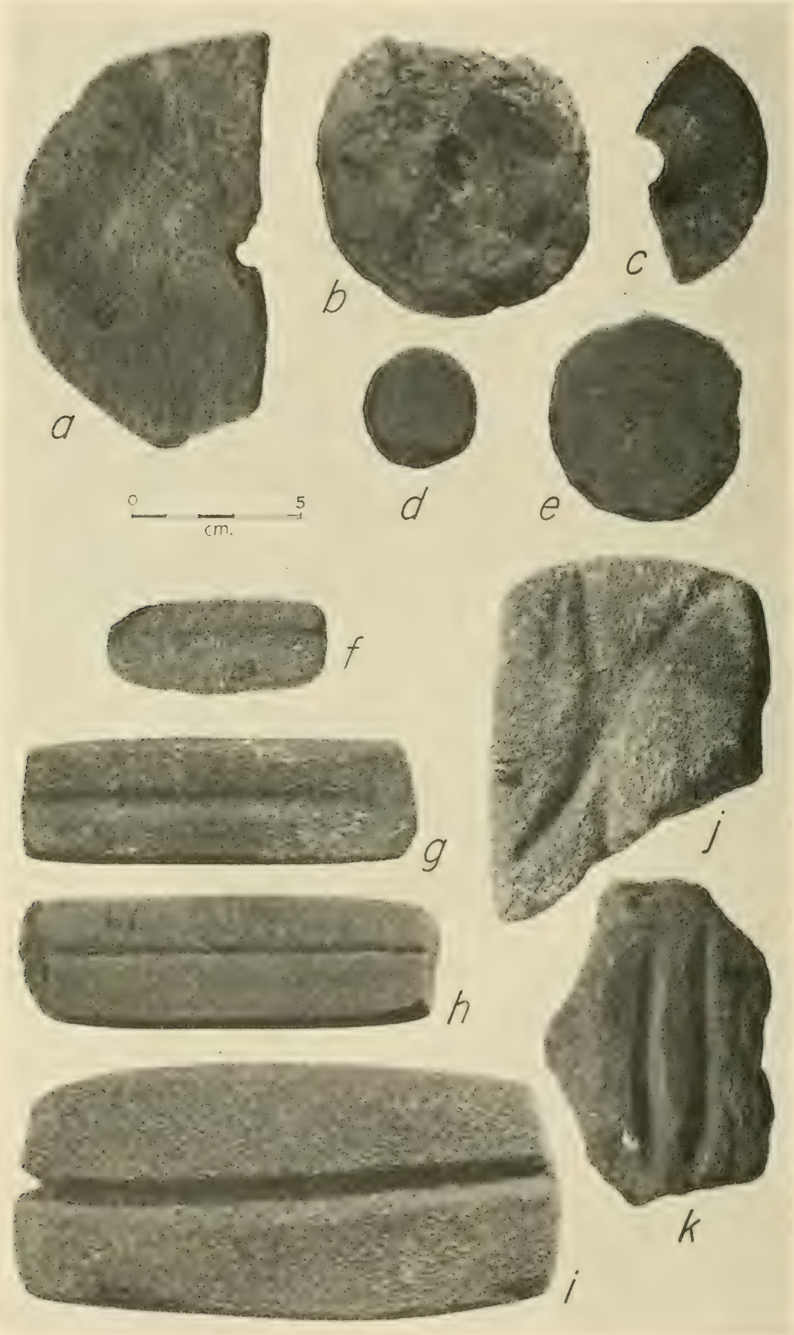
Top and side views of chipped end scrapers from Tobias site, Rice County.



Grooved mauls and shaft polishers from various sites in Rice and Cowley Counties.



Grinding stones from Tobias (*a*, *d*, *f*, *g*, *h*) and Thompson (*b*, *c*, *e*) sites, Rice County.


a
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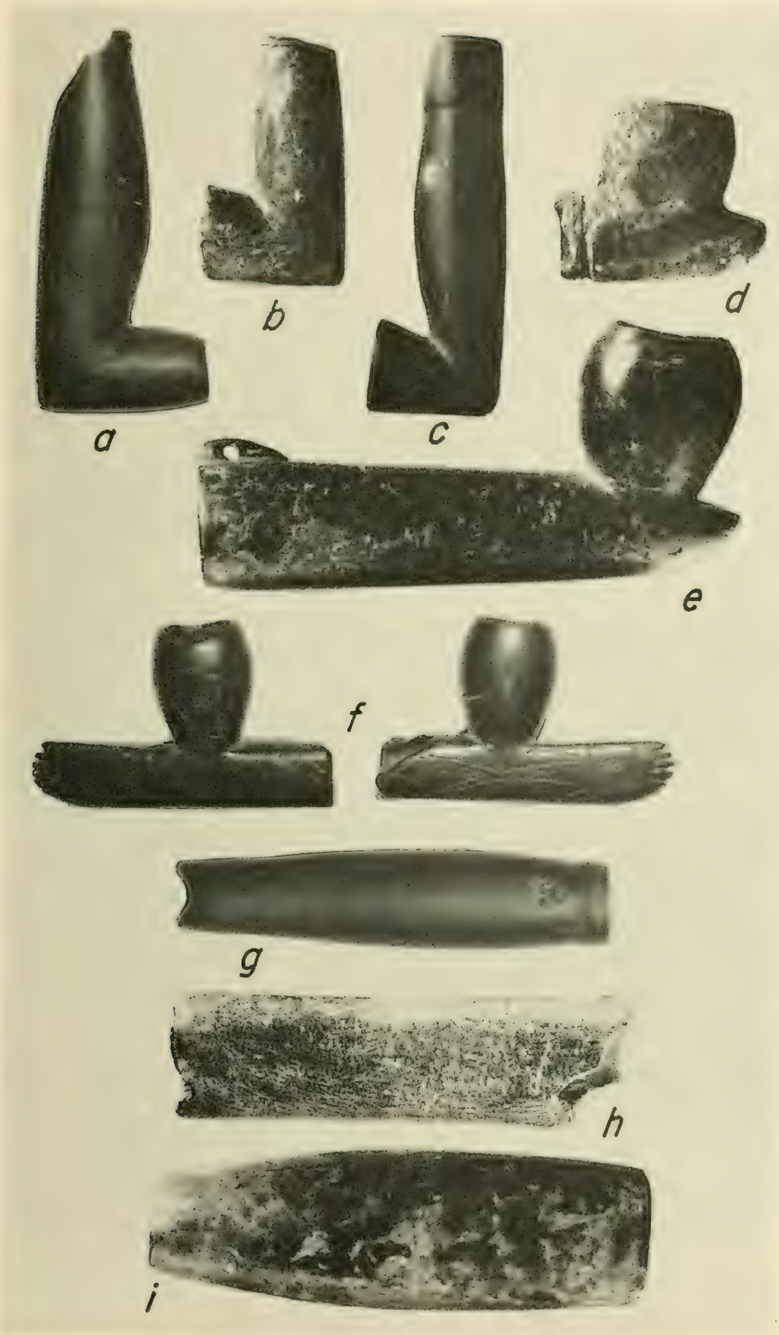
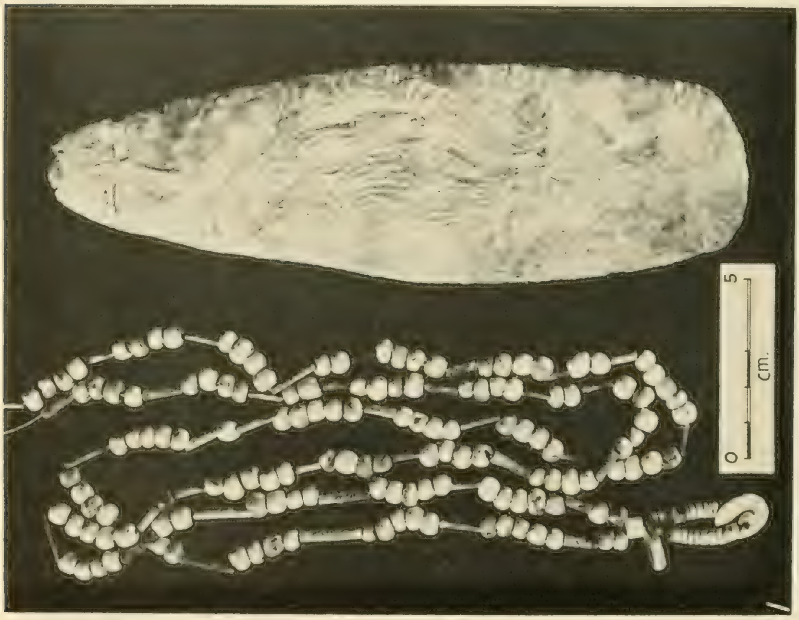
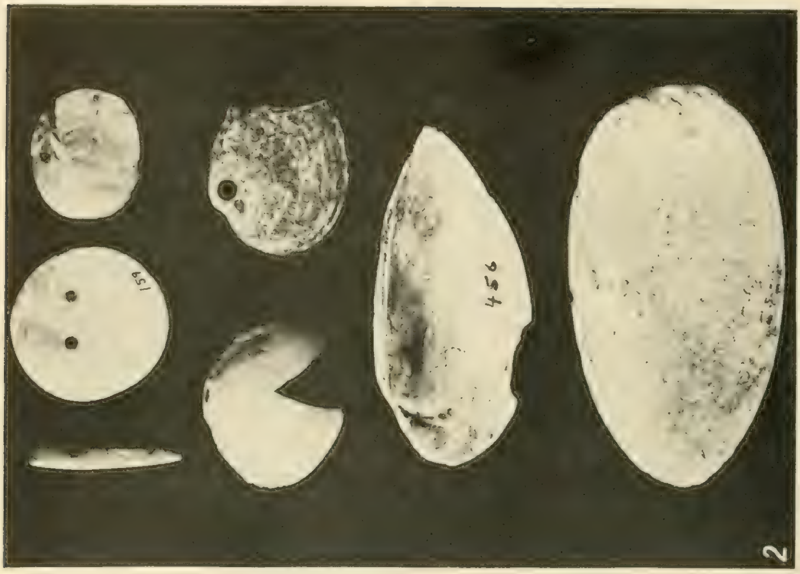
Sandstone disks and abrading stones from Tobias and Malone (*f*, *h*, *i*) sites, Rice County.

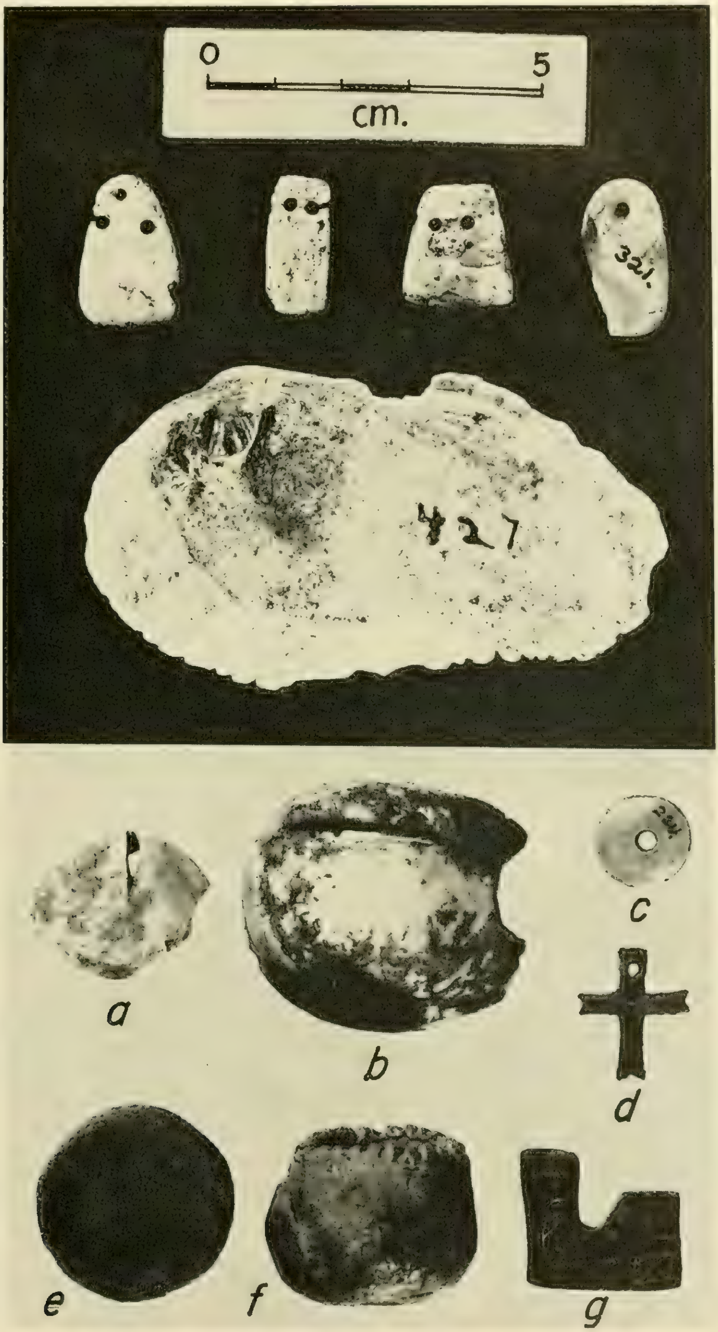


Stone pipes from Tobias site and vicinity, Rice County.



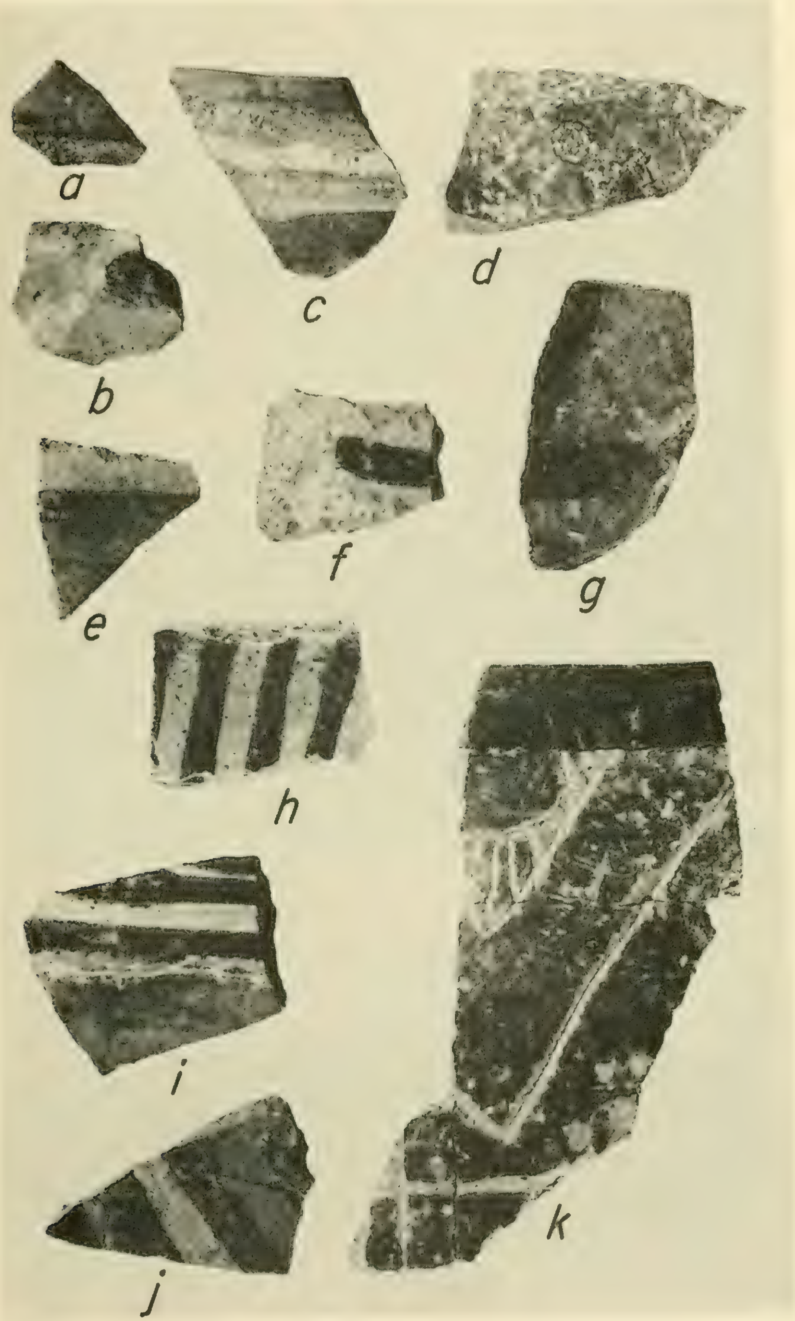


Miscellaneous objects from Rice and Cowley (No. 456) Counties.

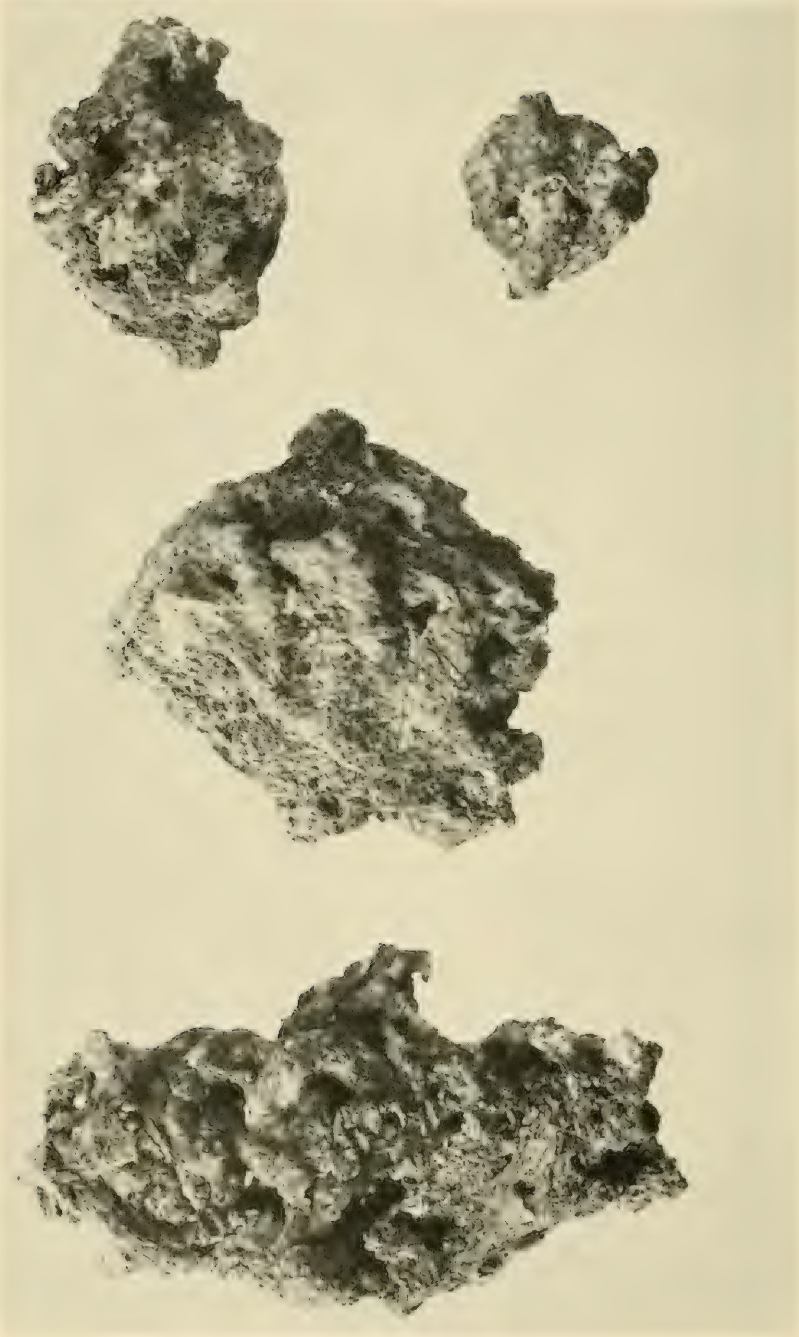

0
5
cm.
321.
427
a
b
c
d
e
f
g

Miscellaneous objects from Rice and Doniphan (*d*, *g*) Counties.

Thompson site, 14RC9, Rice County.

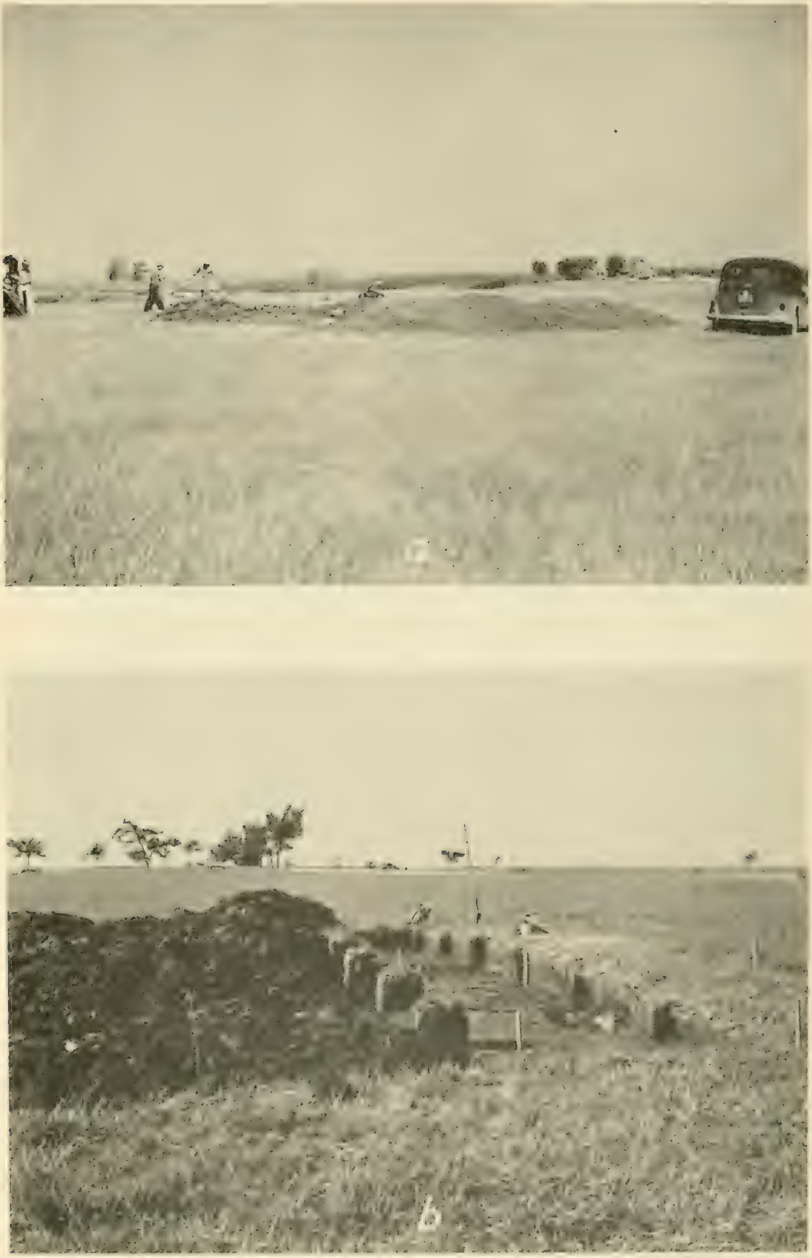


Pueblo and other exotic potsherds from various sites in Rice and Cowley Counties.

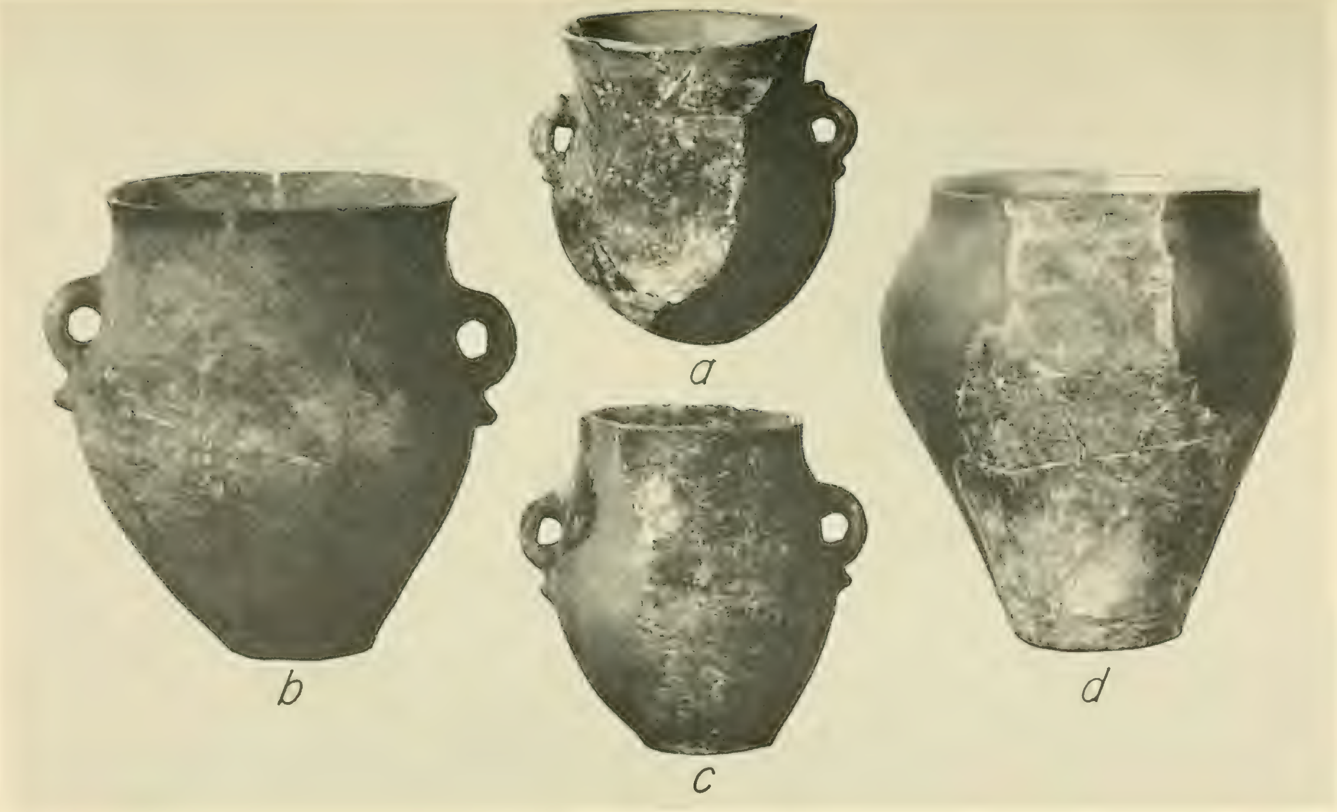


Oxidized chain mail fragments, pit 4, Thompson site. (× 2.)

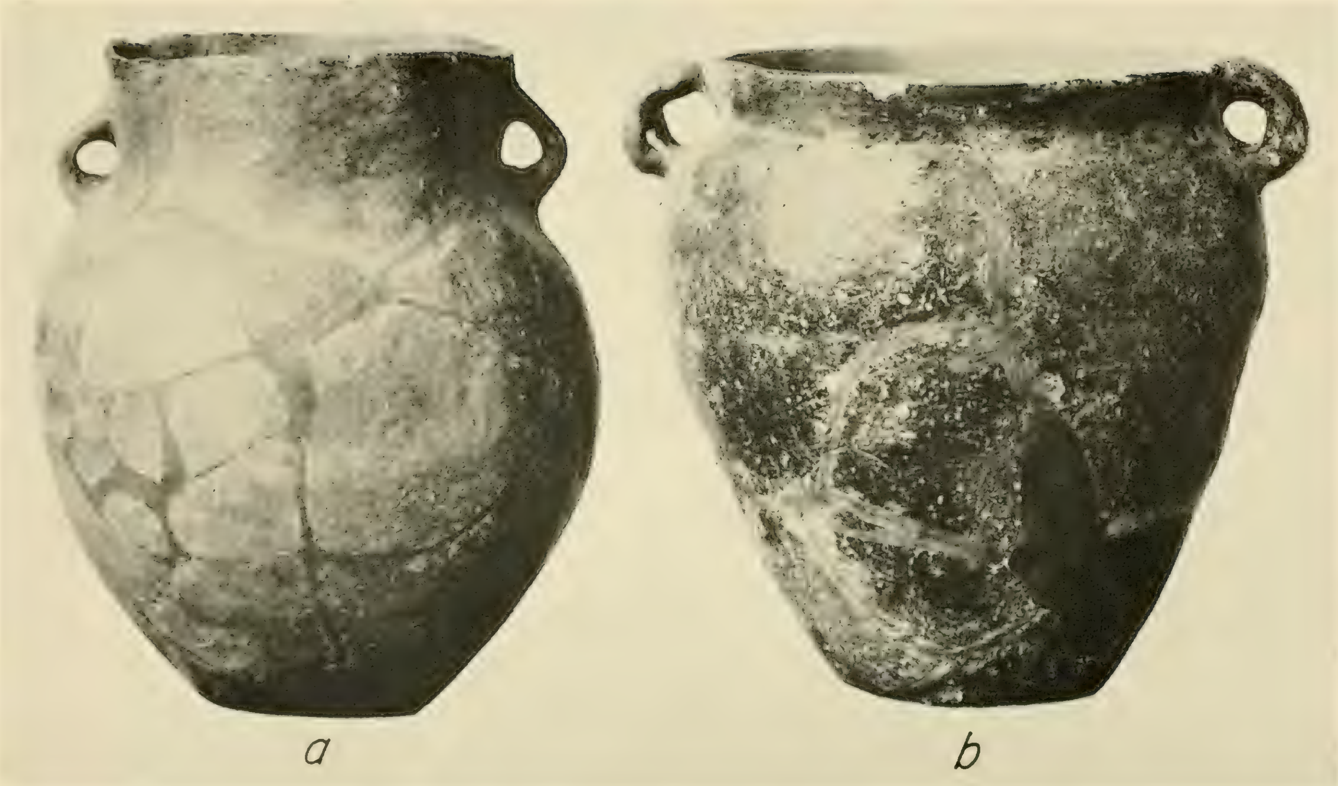
Larcom-Haggard site, 14CO1, Cowley County.



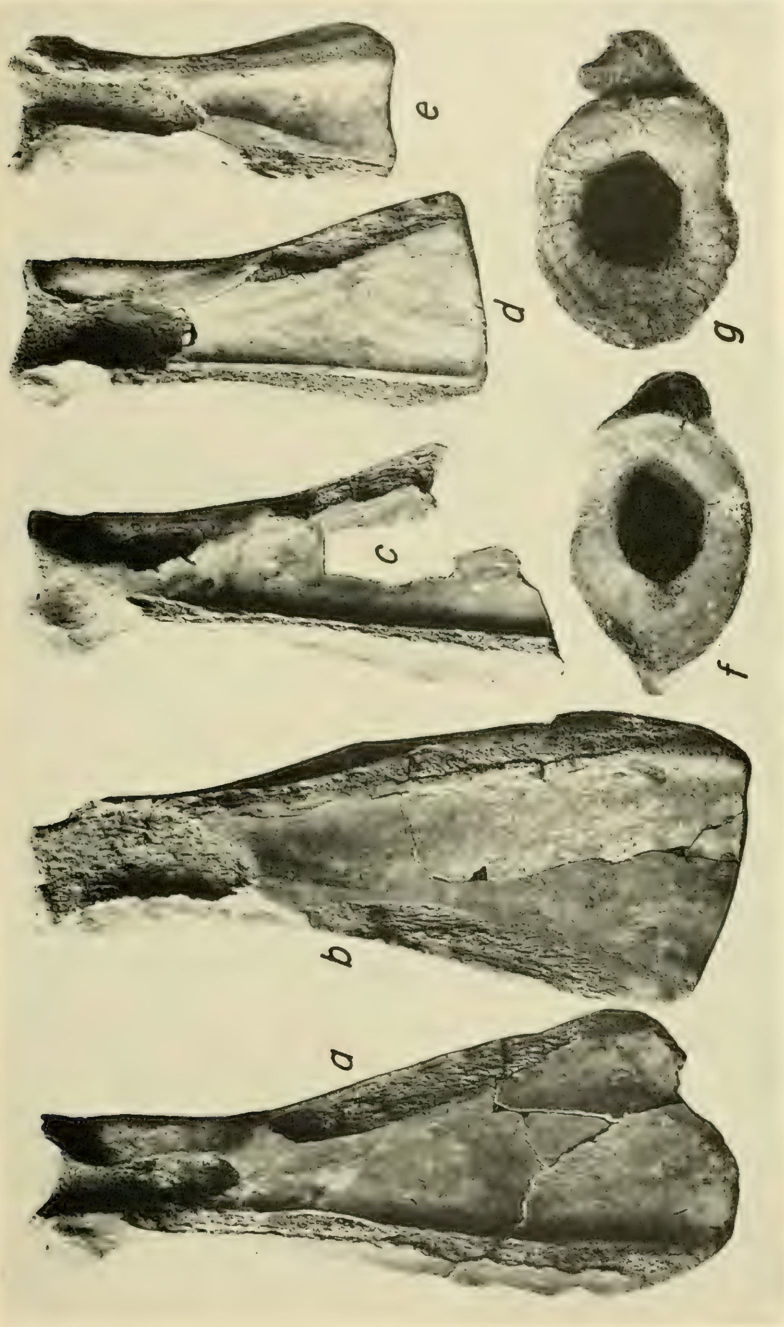
Arkansas City Country Club site, 14CO3, Cowley County.



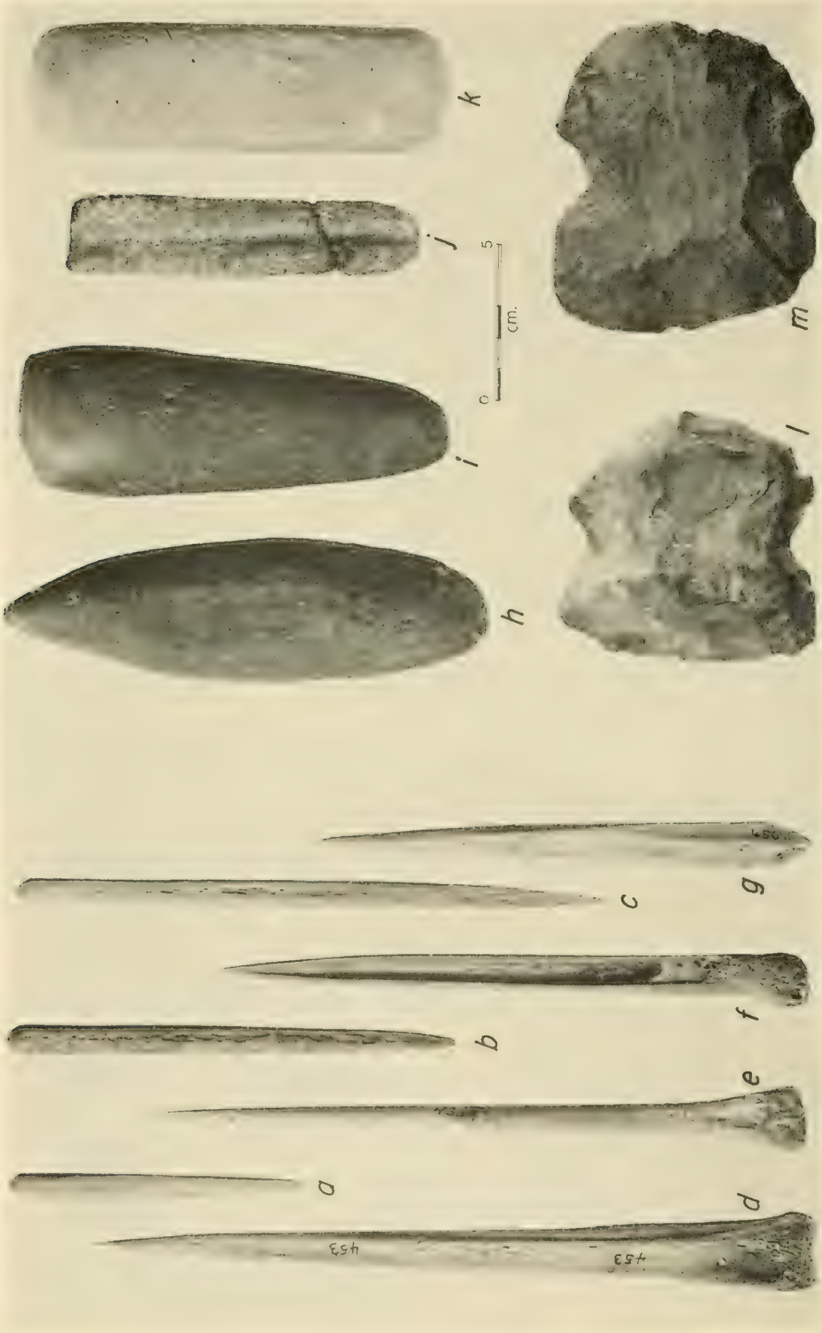
Restored pottery vessels, type Cowley Plain, from various sites in Cowley County.



Restored pottery vessels, type Cowley Plain, from Larcom-Haggard site. Collection of Louis Essex.



Socketed scapula hoes from Cowley County sites.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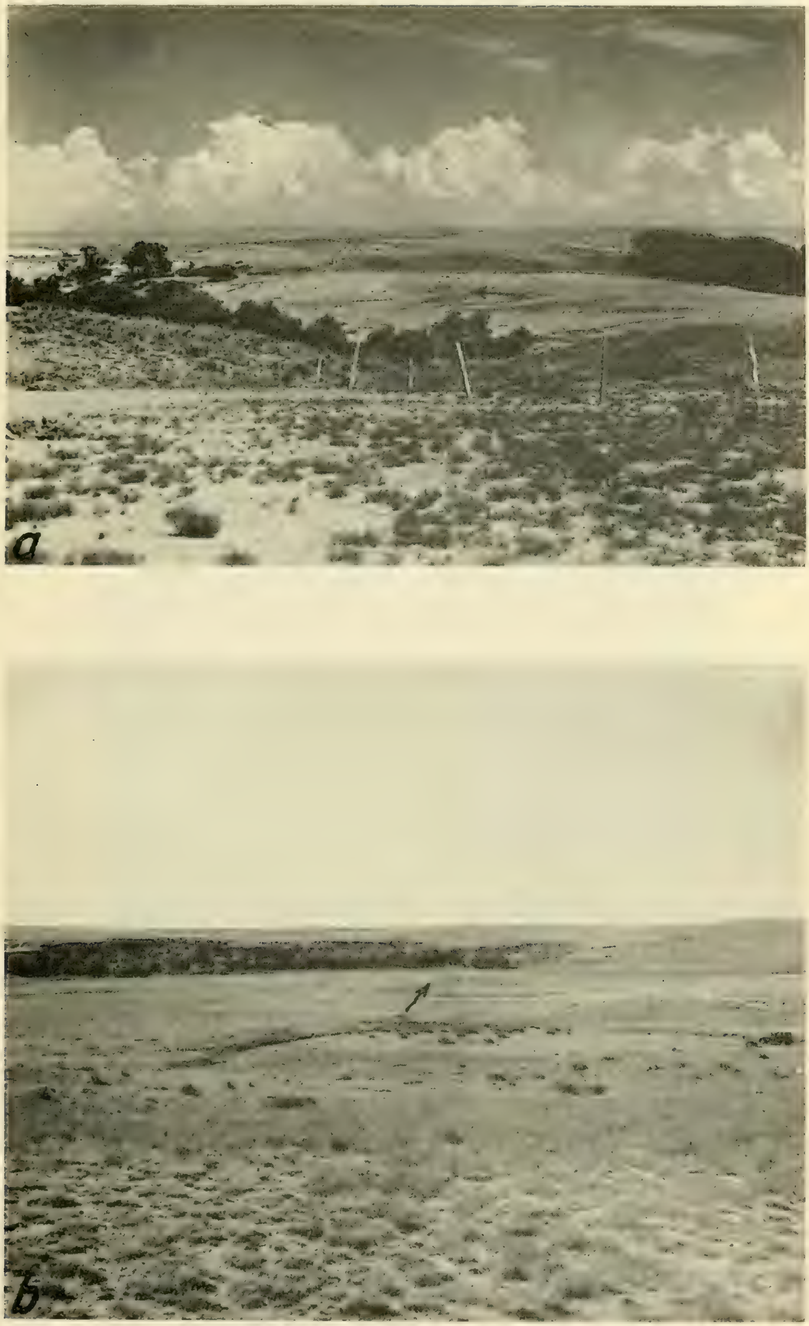
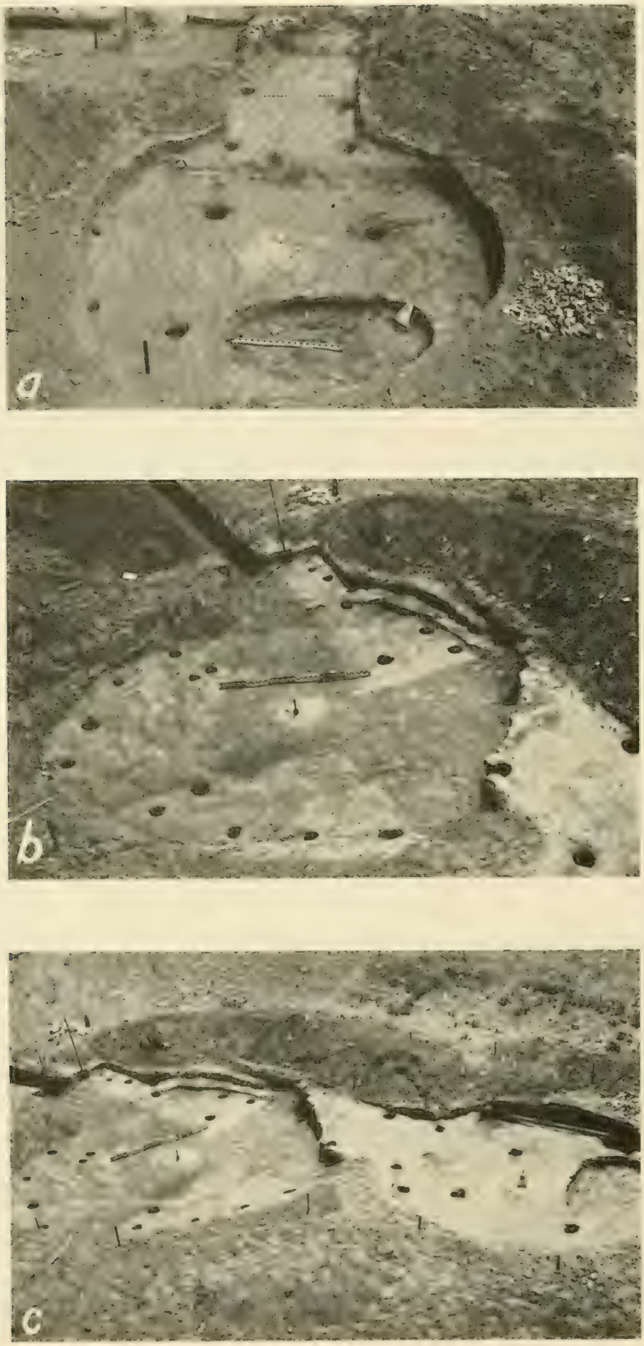
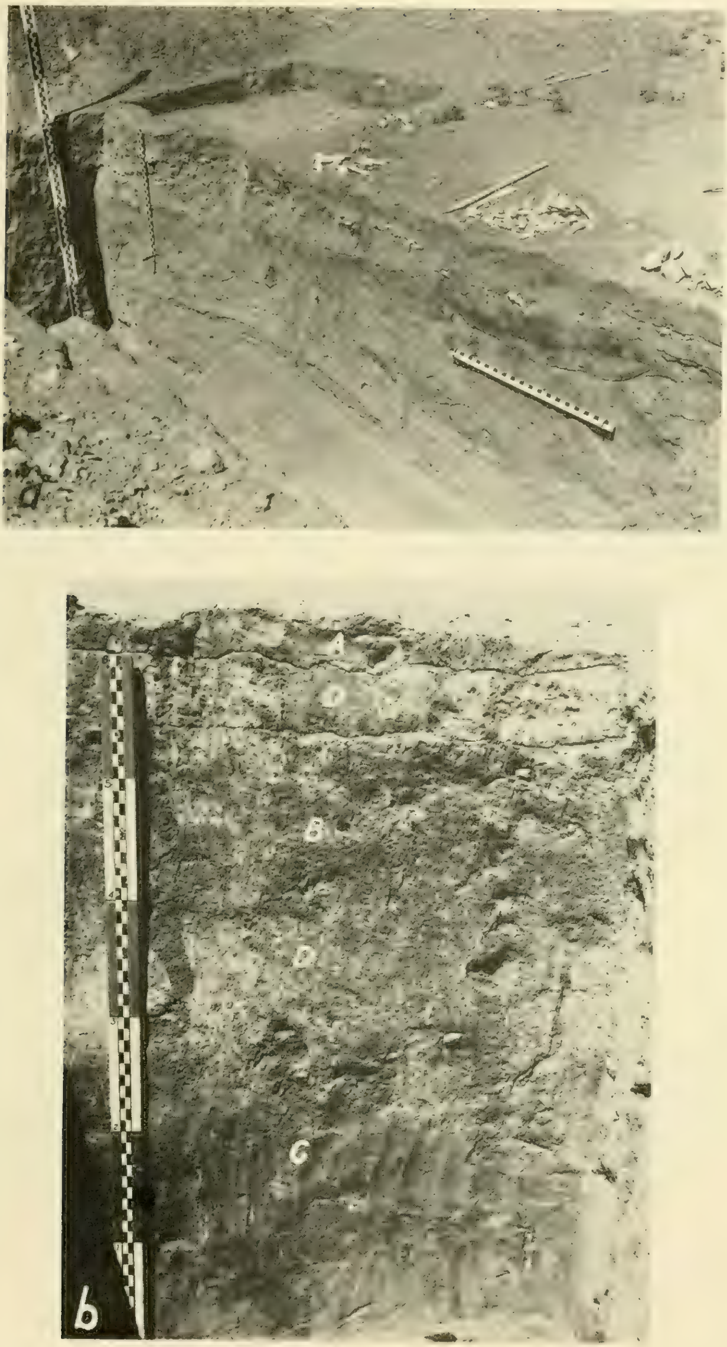
Bone and stone artifacts from Cowley and Lane County sites.



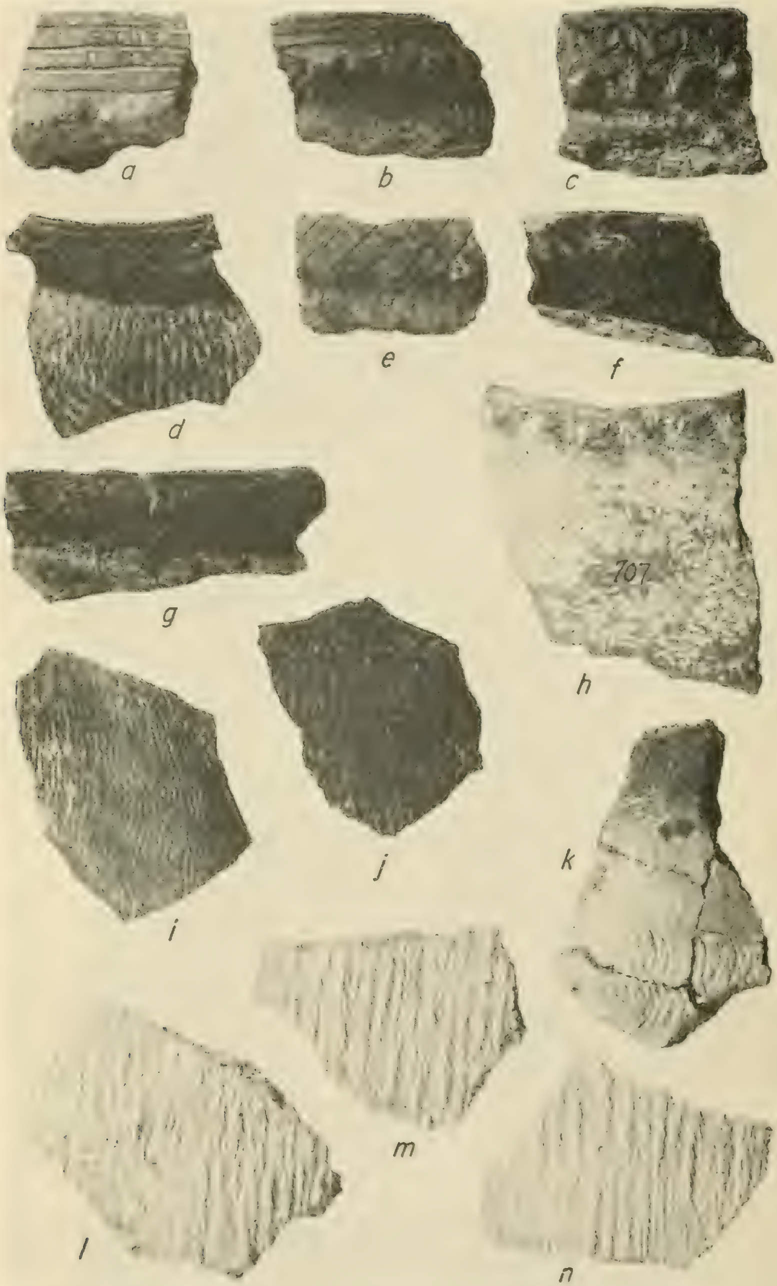
Pottorff (14LA1) and Risston (14SC4) sites on Salt Creek, on Lane-Scott County line.



Houses 1 and 2 excavations, Pottorff site, 14LA1.



Excavations at the Pottorff site, 14LA1.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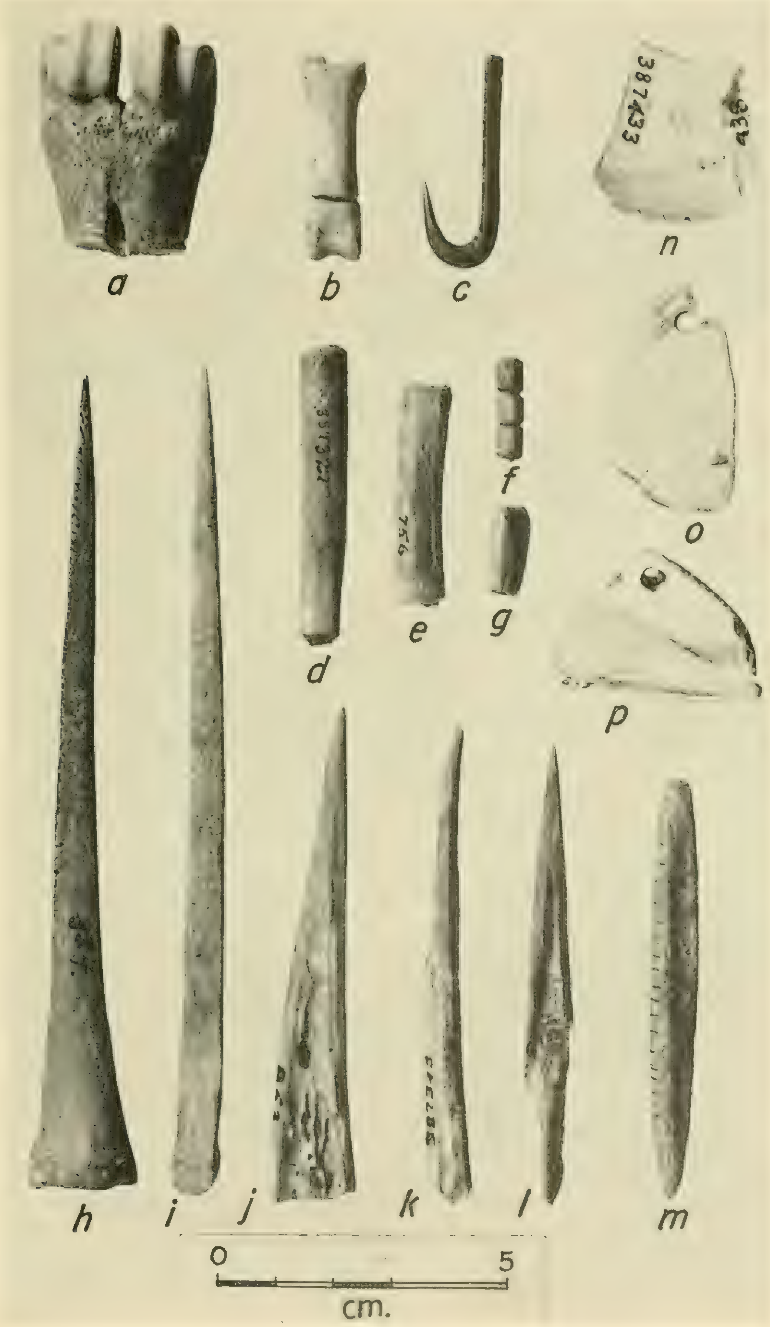
Pottery from Upper Republican and Woodland occupations, Pottorff site.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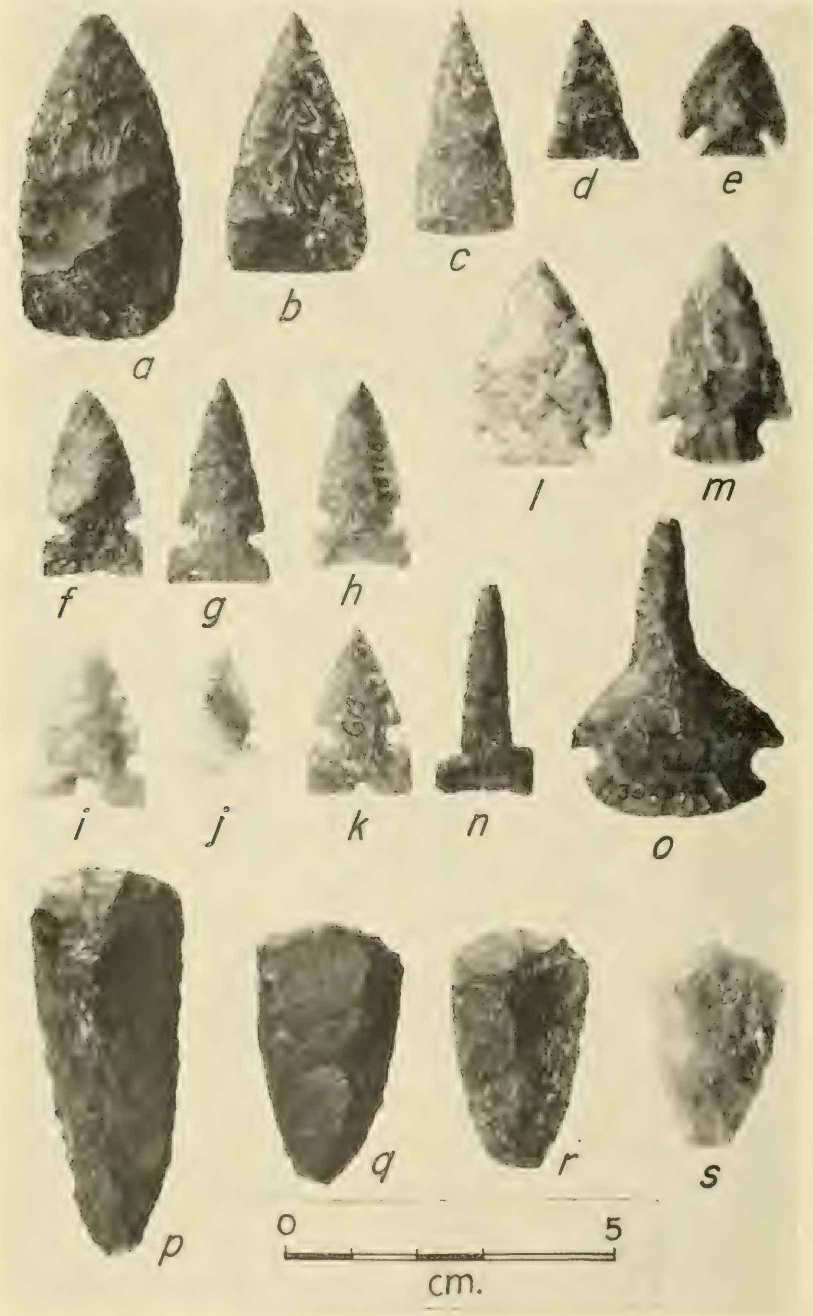
Bone and shell objects, Pottorff site.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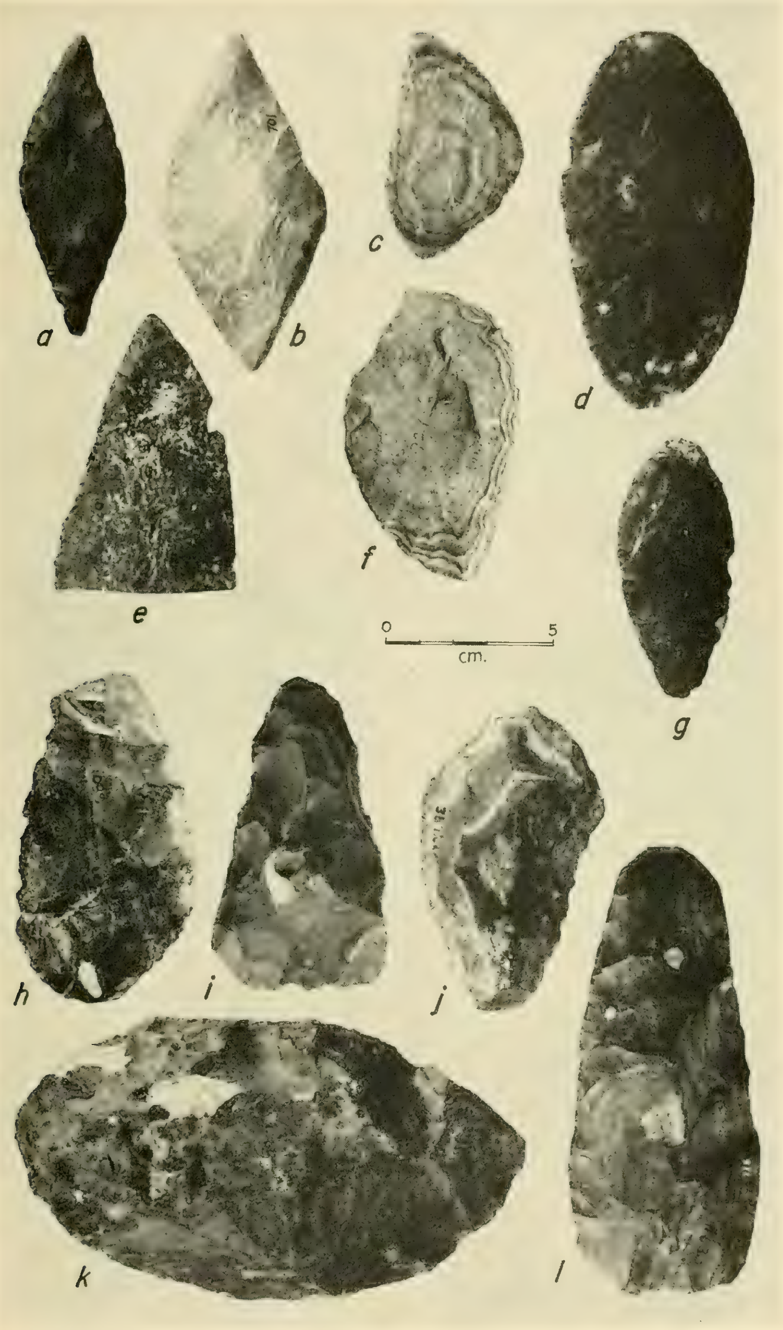
Projectile points, drills, and end scrapers, Pottorff site.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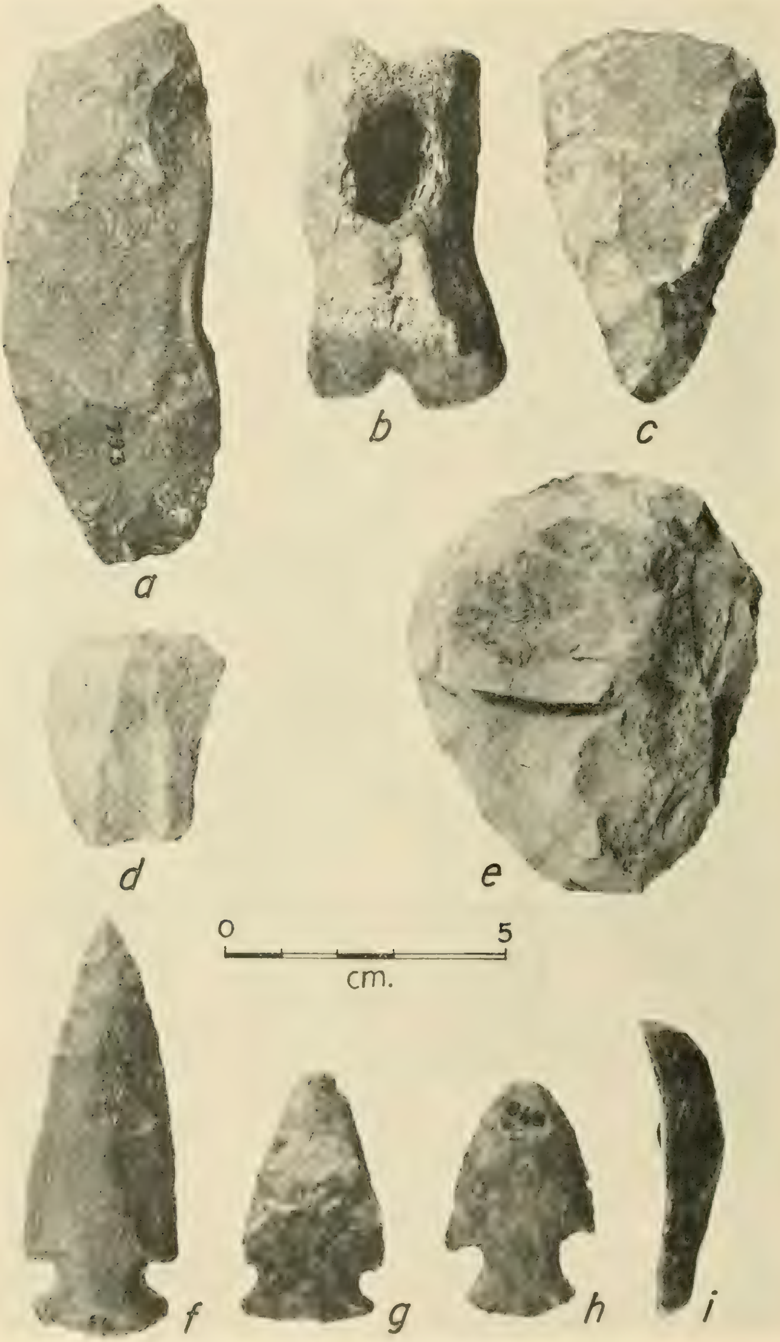
Knives and other chipped forms, Pottorff site.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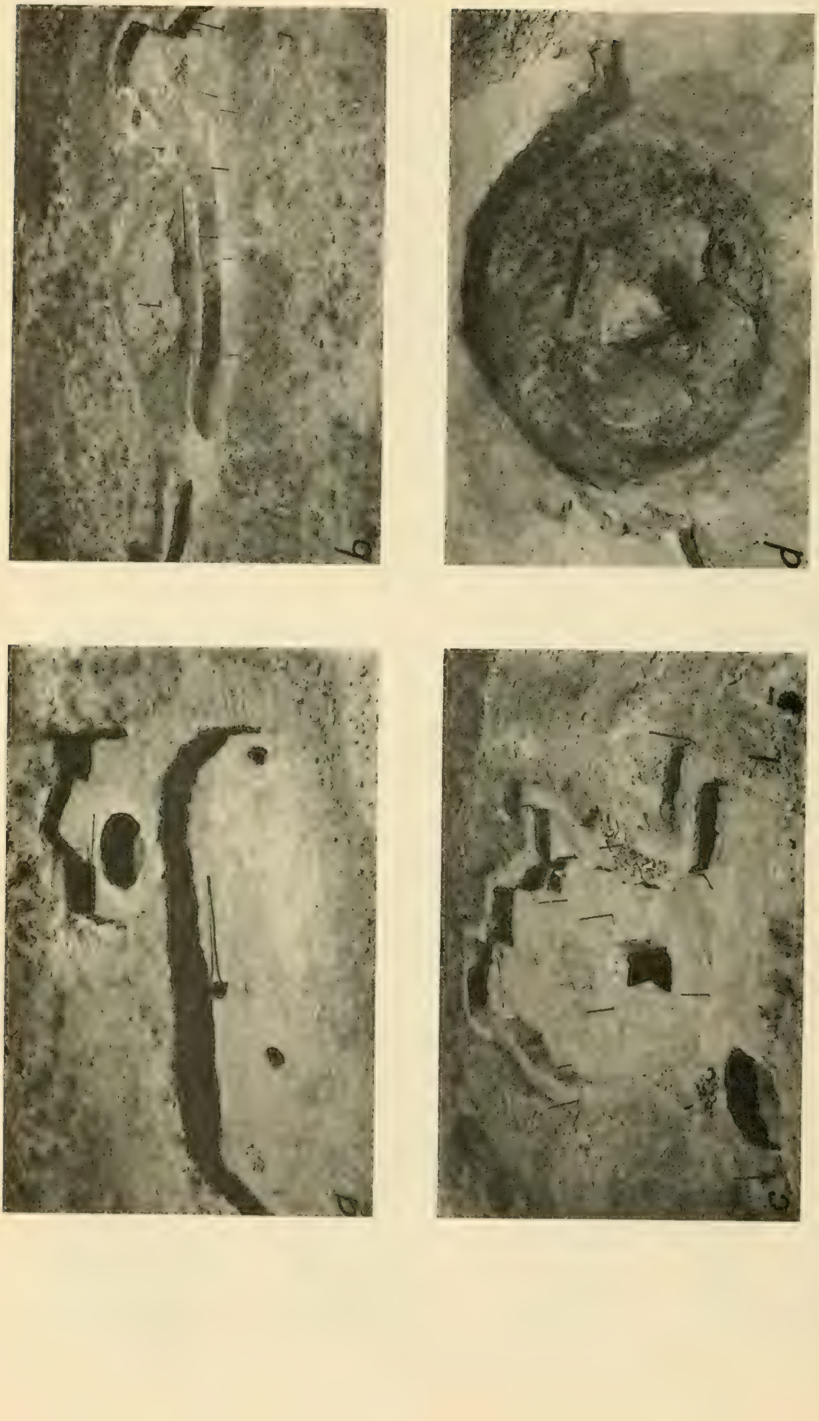
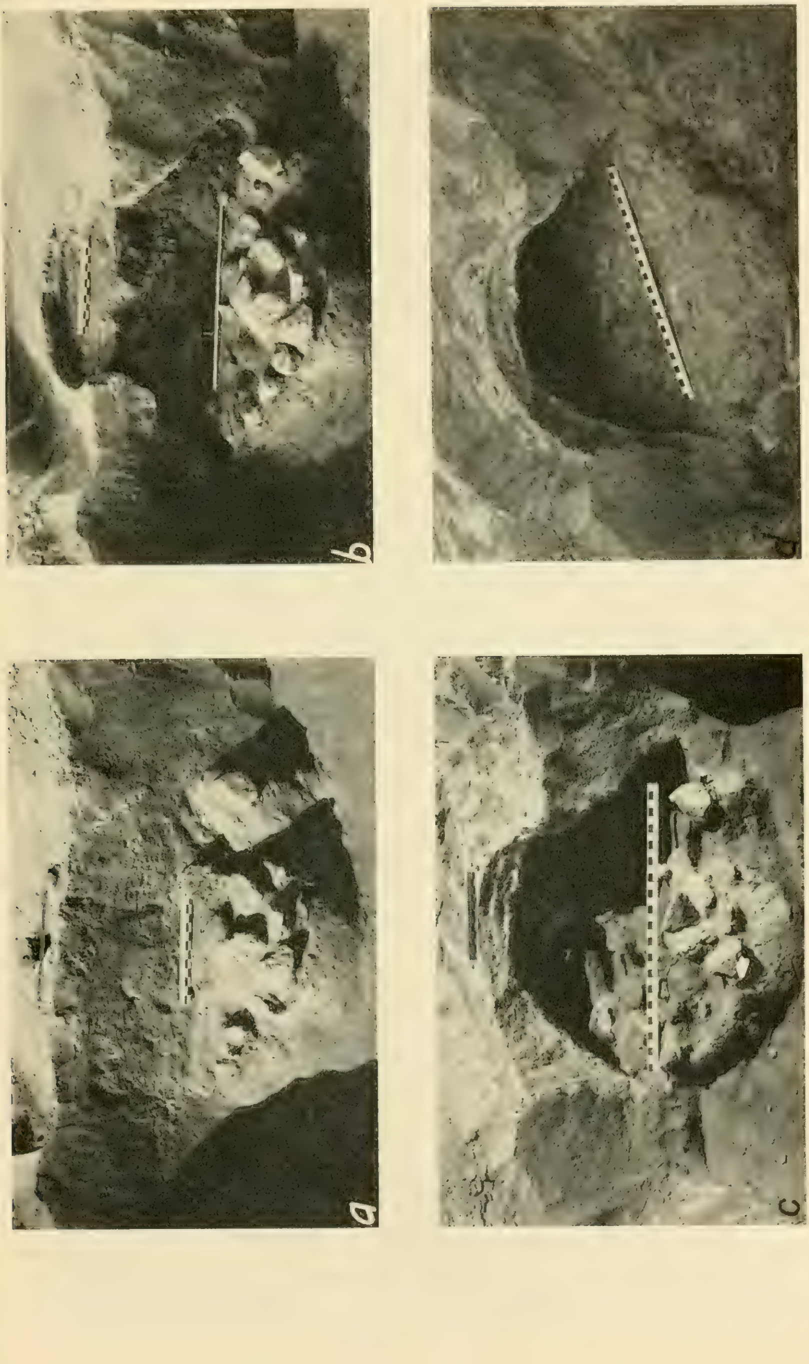
Stone and bone objects from Occupation B (Woodland), Pottorff site.

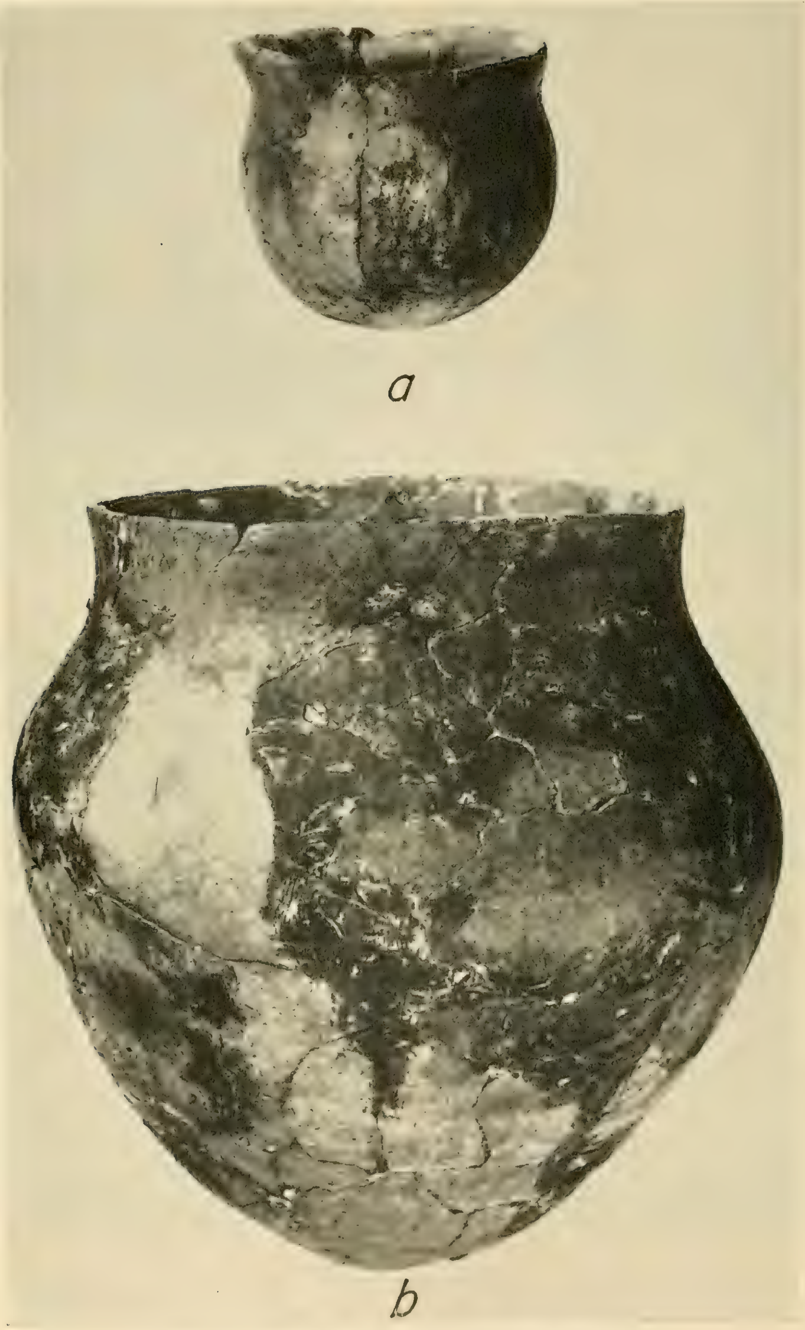
Scott County State Park and site 14SC1.



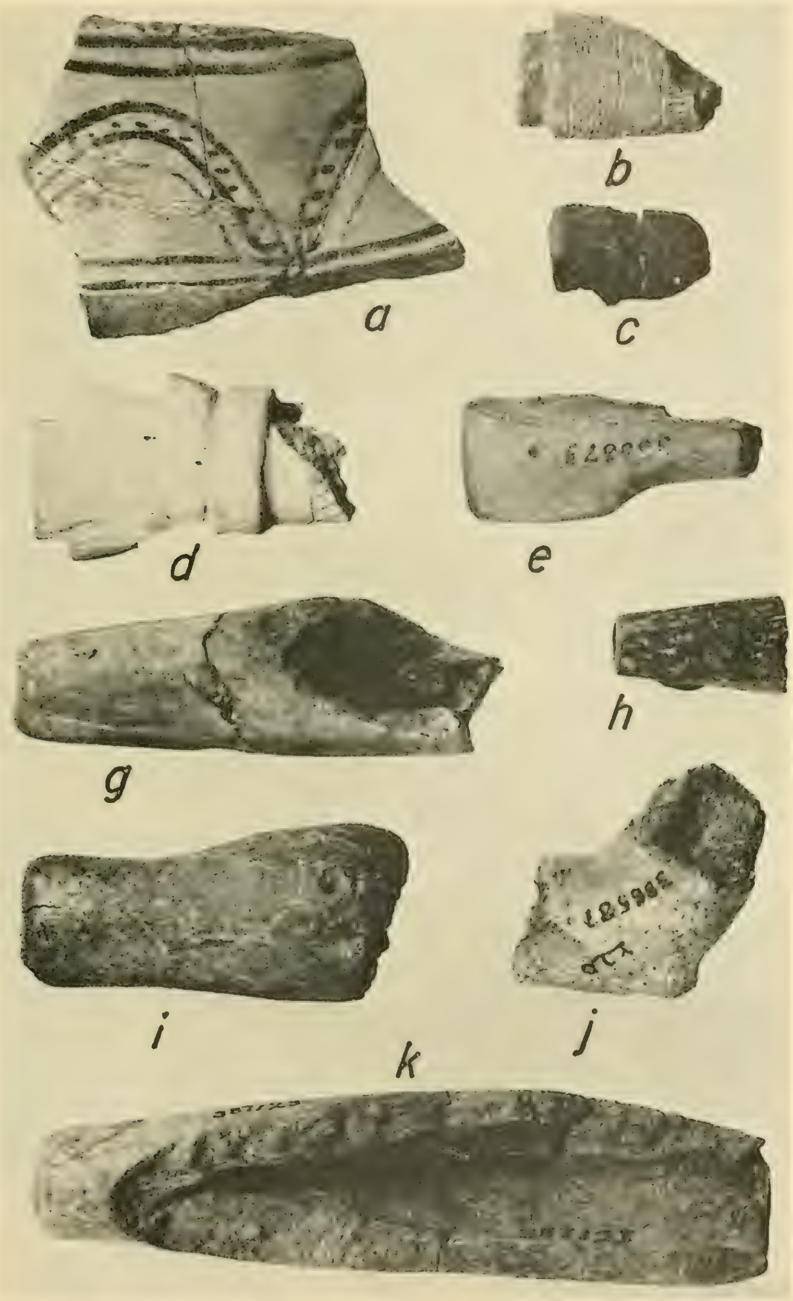
Excavations at 14SC1, in Scott County State Park.



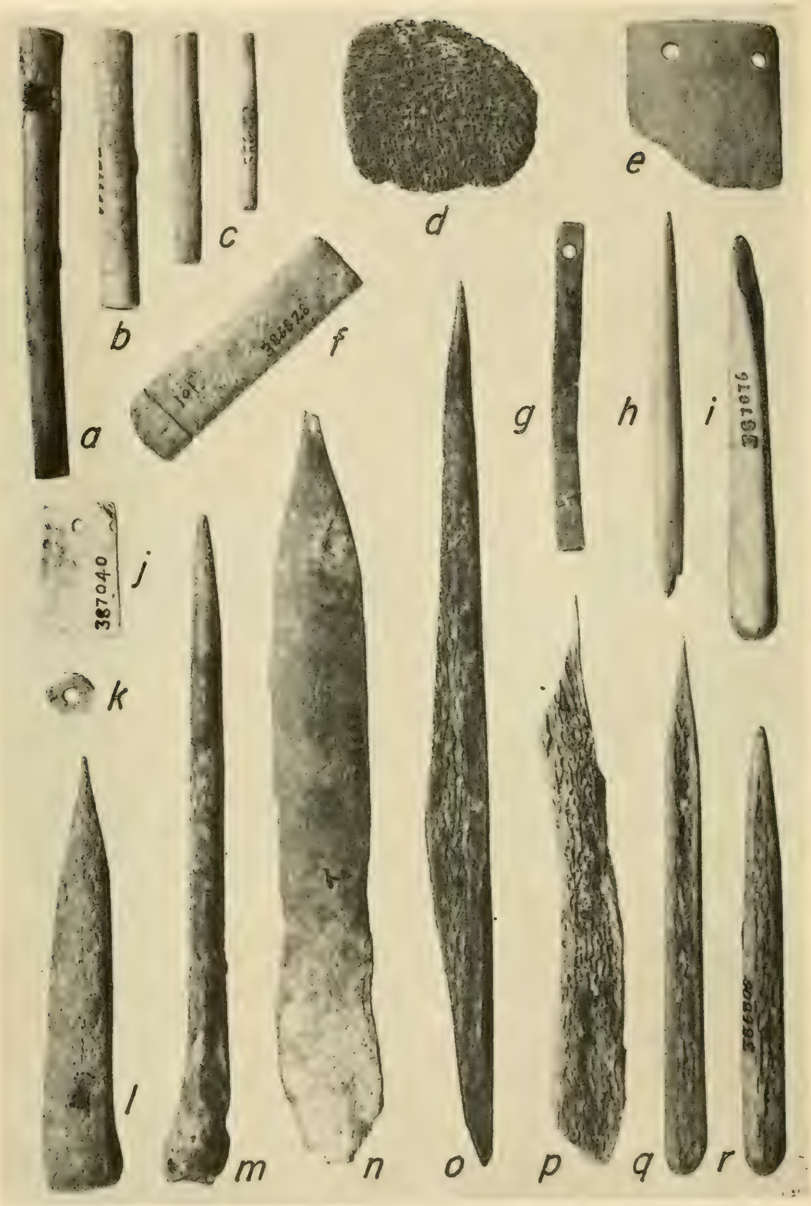
Roasting or baking pit No. 3, Scott County State Park.



Restored pottery vessels from 14SC1, Scott County.



Pottery objects from Scott County site, 14SC1. Actual size.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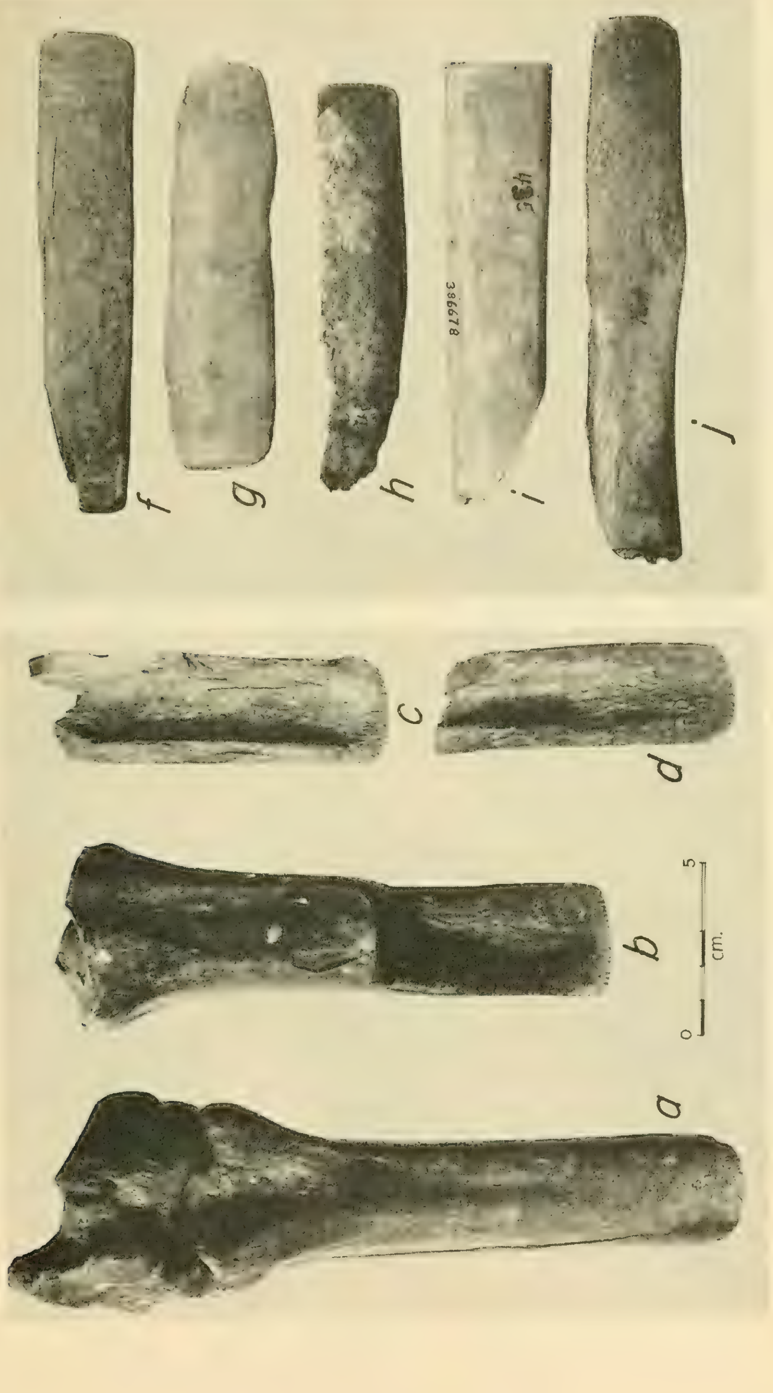
Bone and shell artifacts from 14SC1, Scott County.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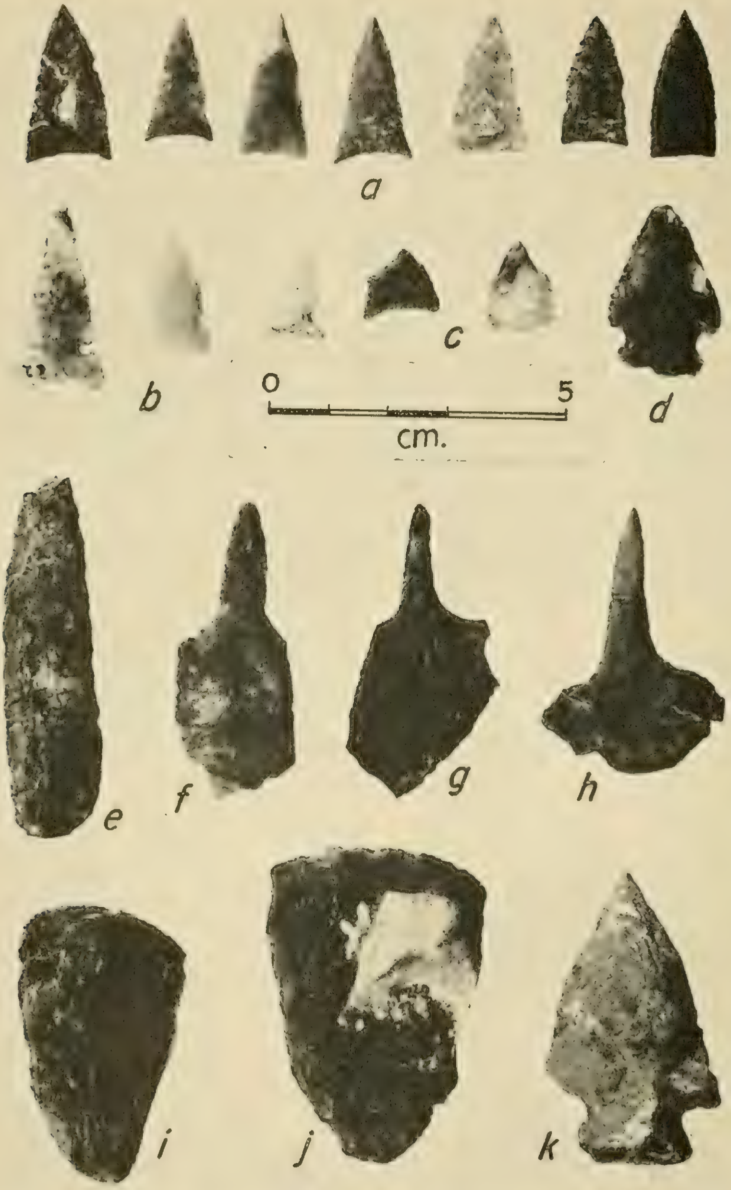
Bone artifacts from 14SC1, Scott County.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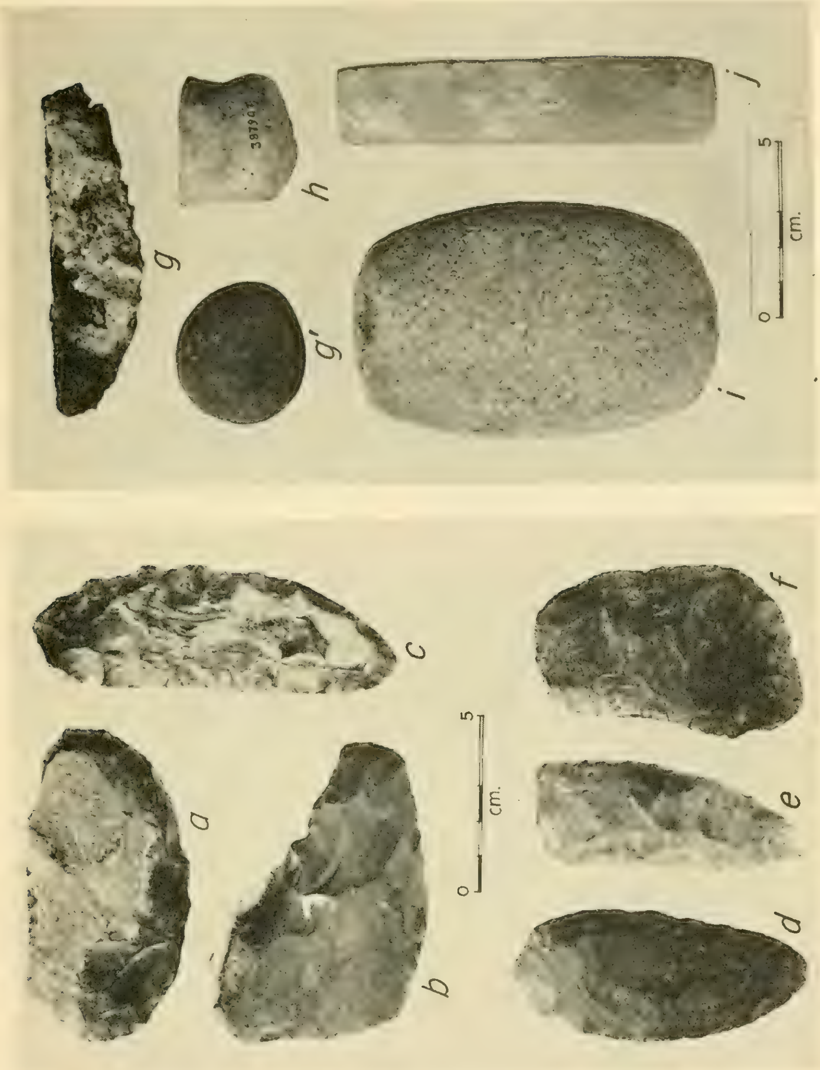
Projectile points, drills, and end scrapers from 14SC1, Scott County.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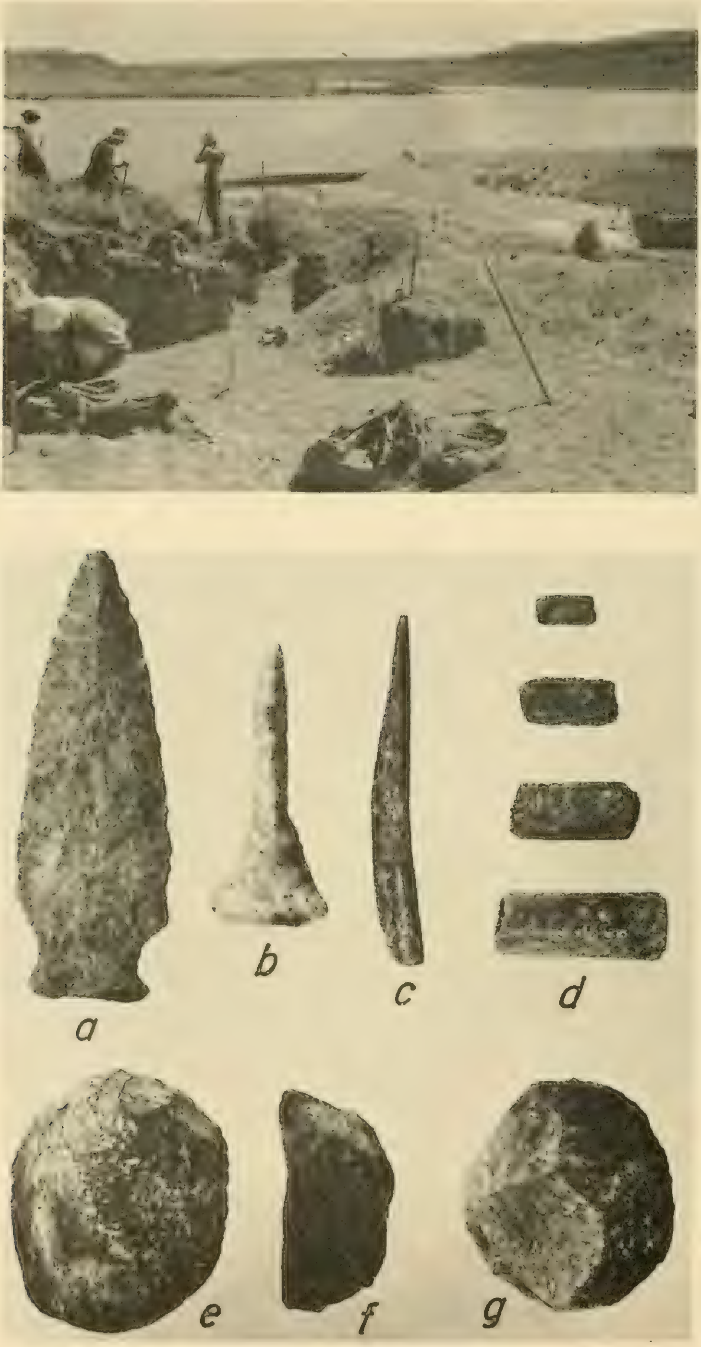
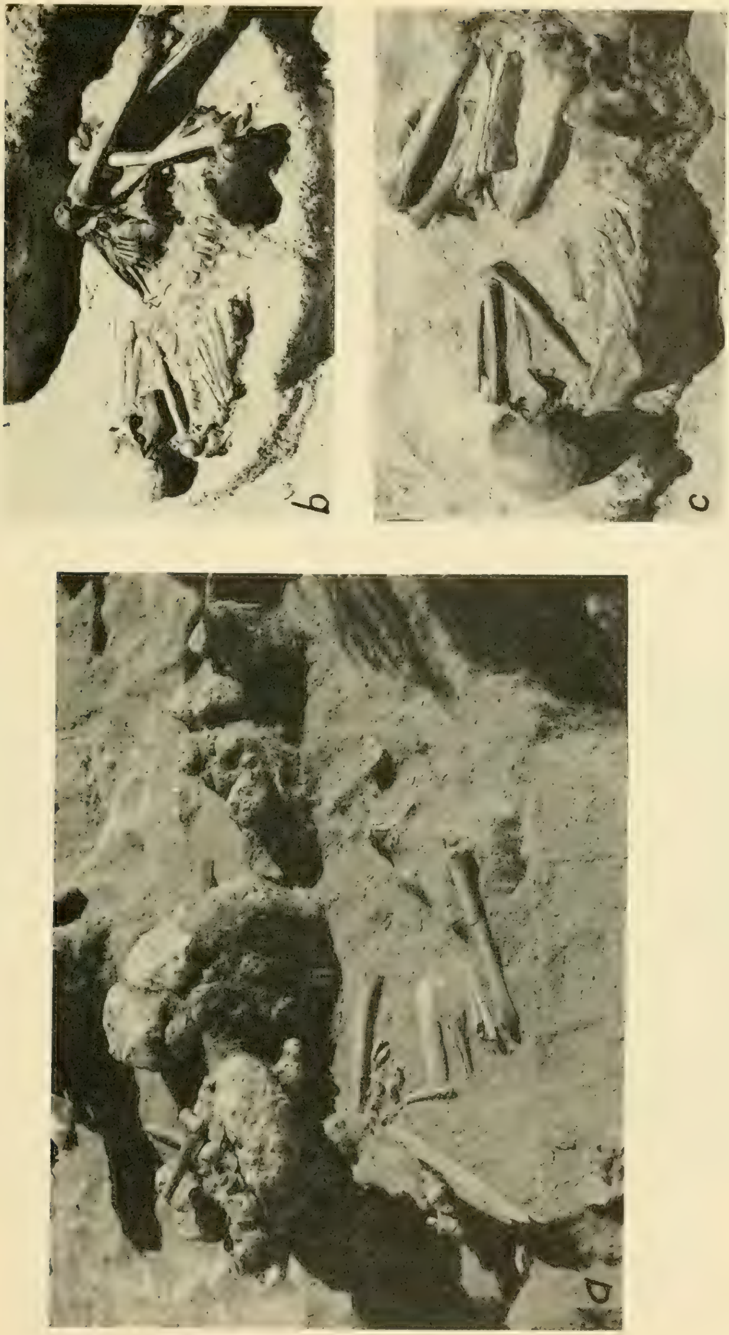
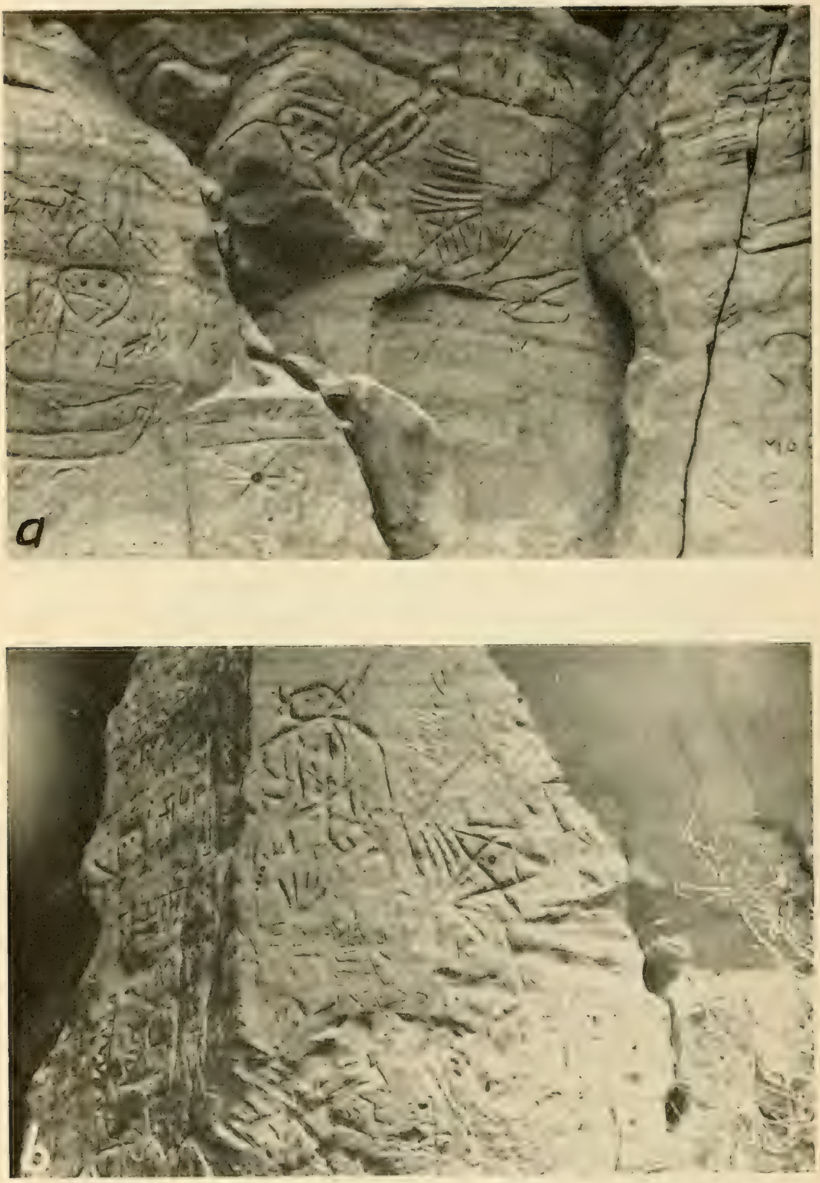
Stone, iron (*g*), and pottery (*h*) objects from 14SC1, Scott County.



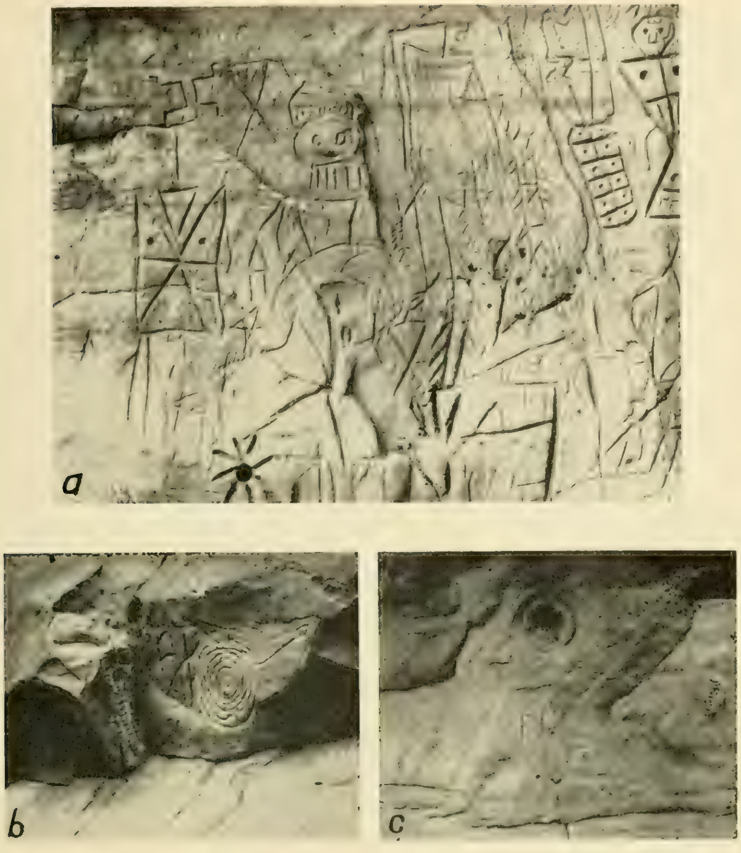
Young burial site 14SC2, Scott County.



Burials in situ, Young burial site, Scott County.

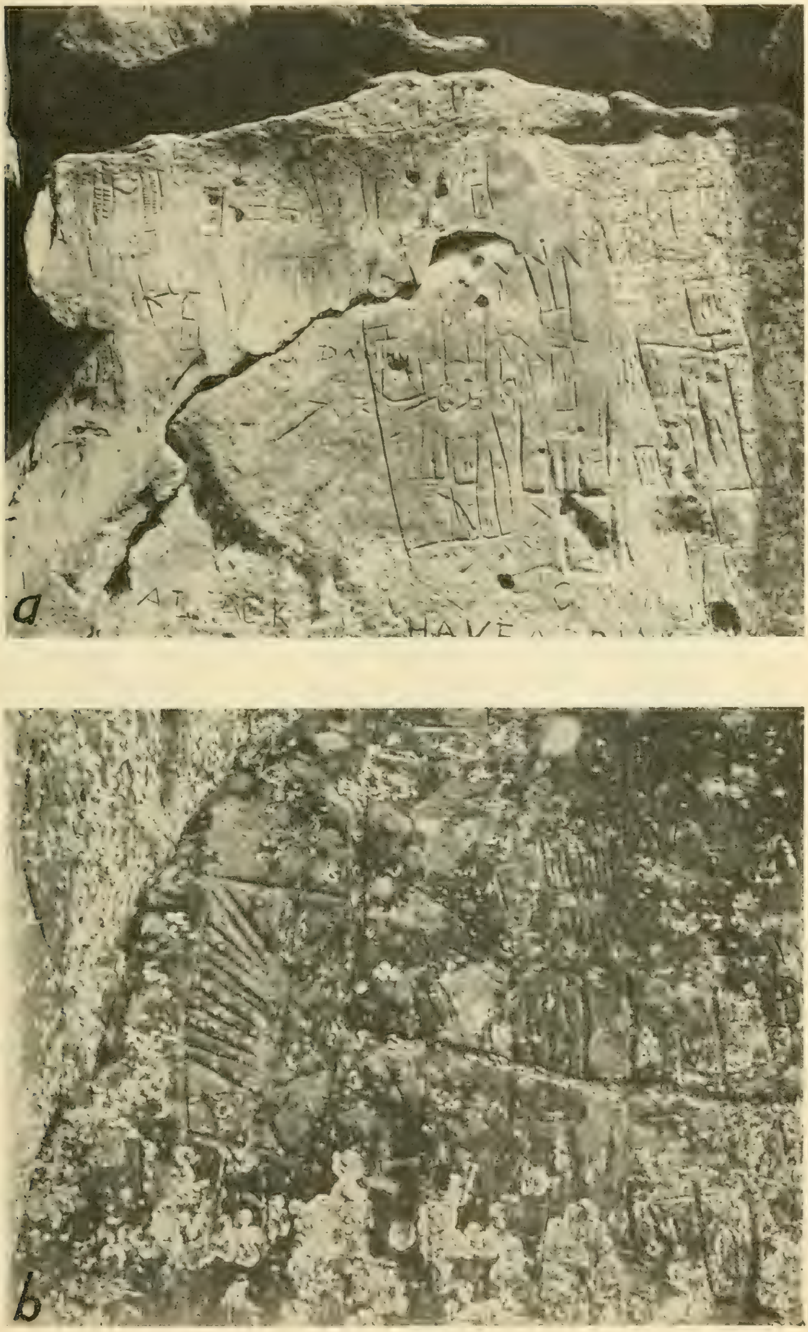


Petroglyphs at Inscription Rock, 14EW1, Ellsworth County.

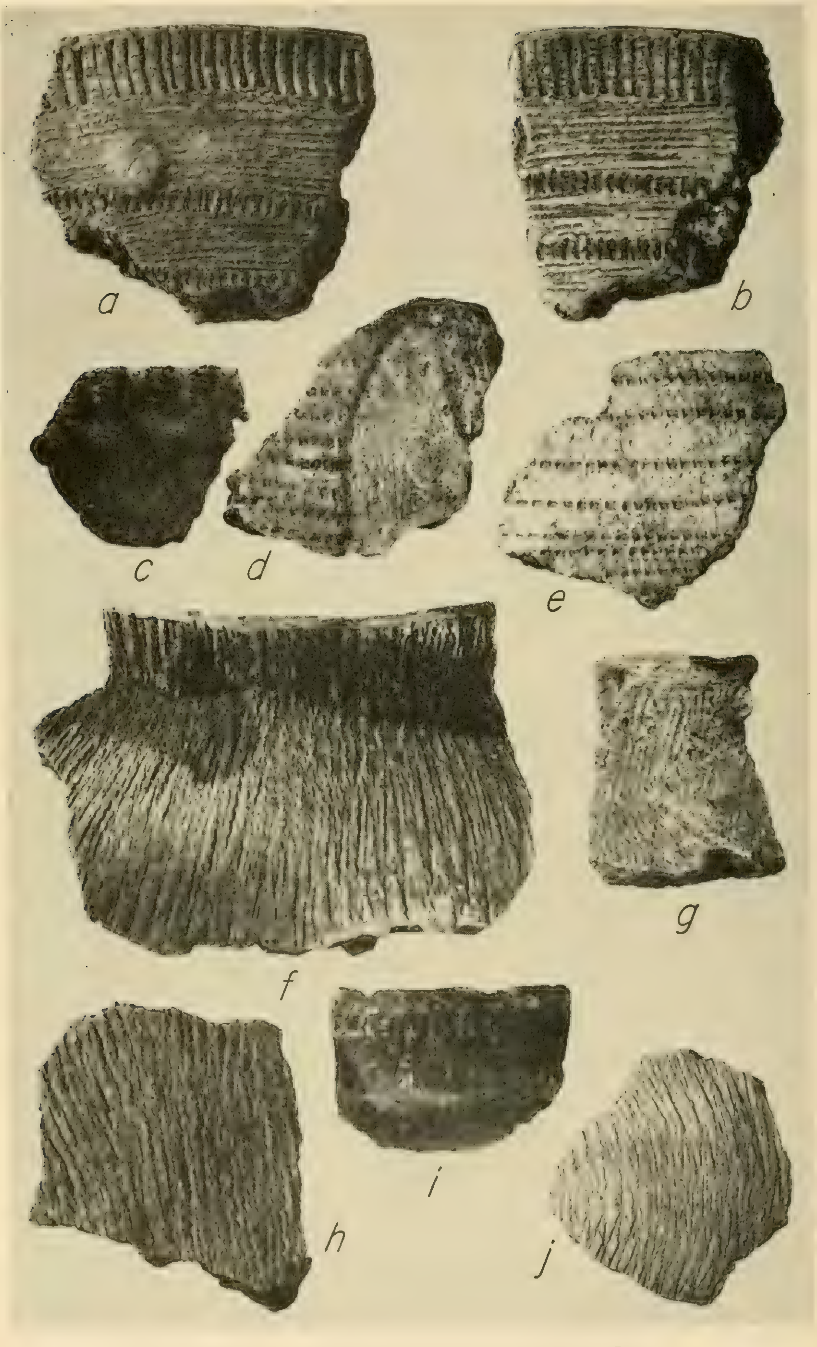


Petroglyphs rom various localities in Kansas.

Petroglyph sites in Rice County.



Anthropomorphic and other petroglyphs at Spriggs Rocks, Rice County.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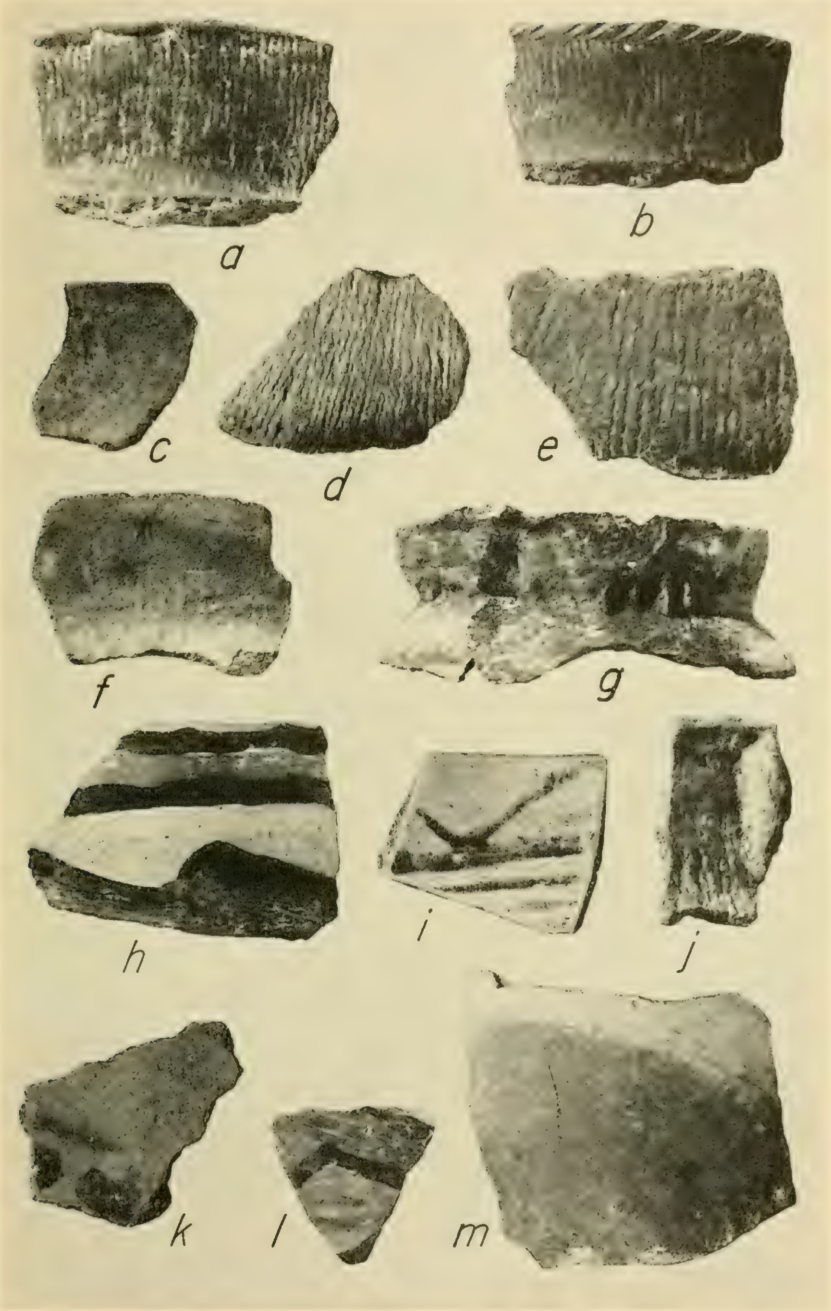
Potsherds from the Roniger site, 14CS1, in Chase County.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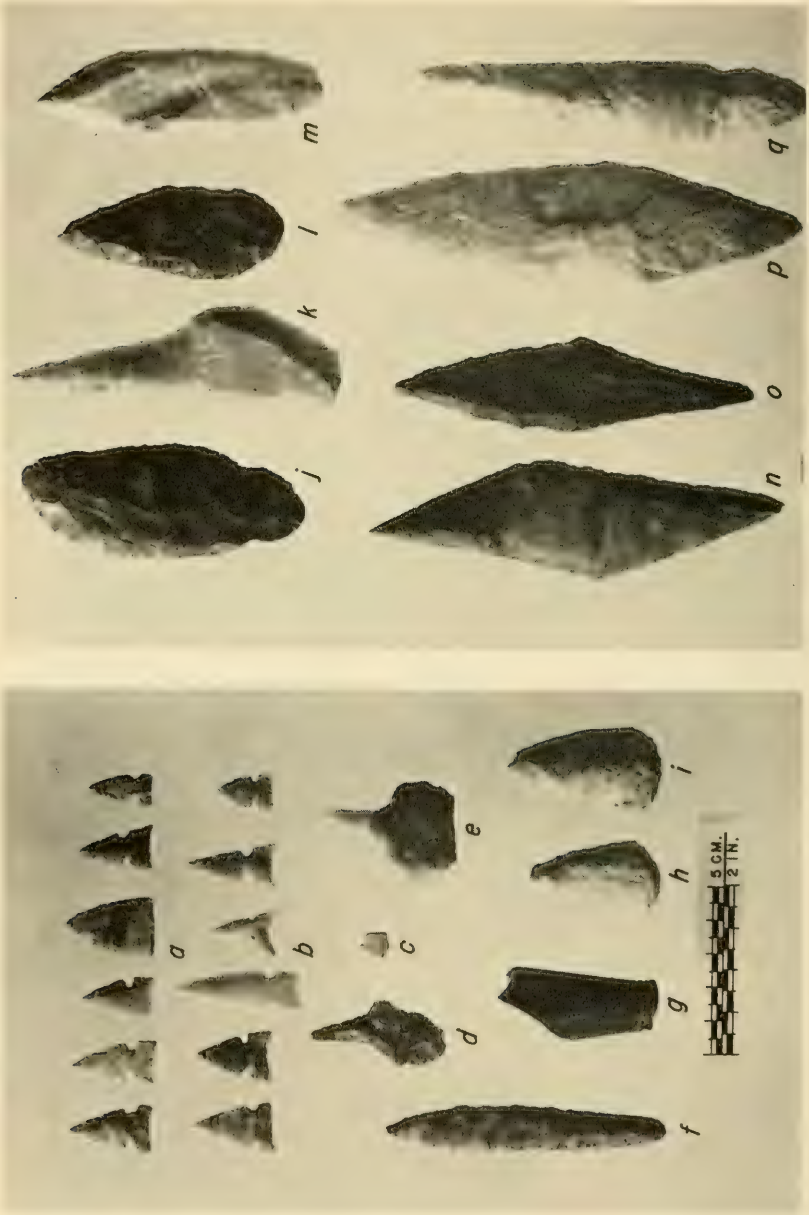
Potsherds from Pratt site, 14PT1.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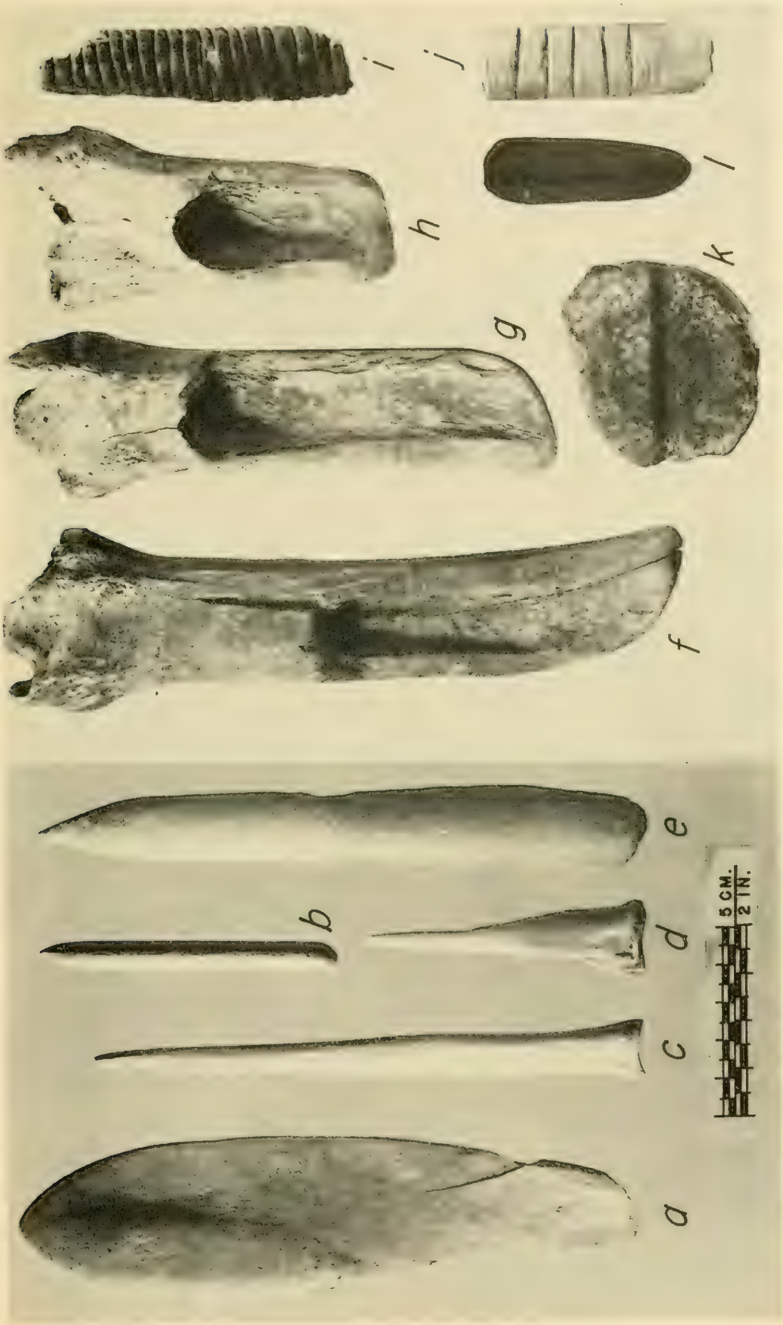
Chipped and ground stone objects from Pratt site, 14PT1.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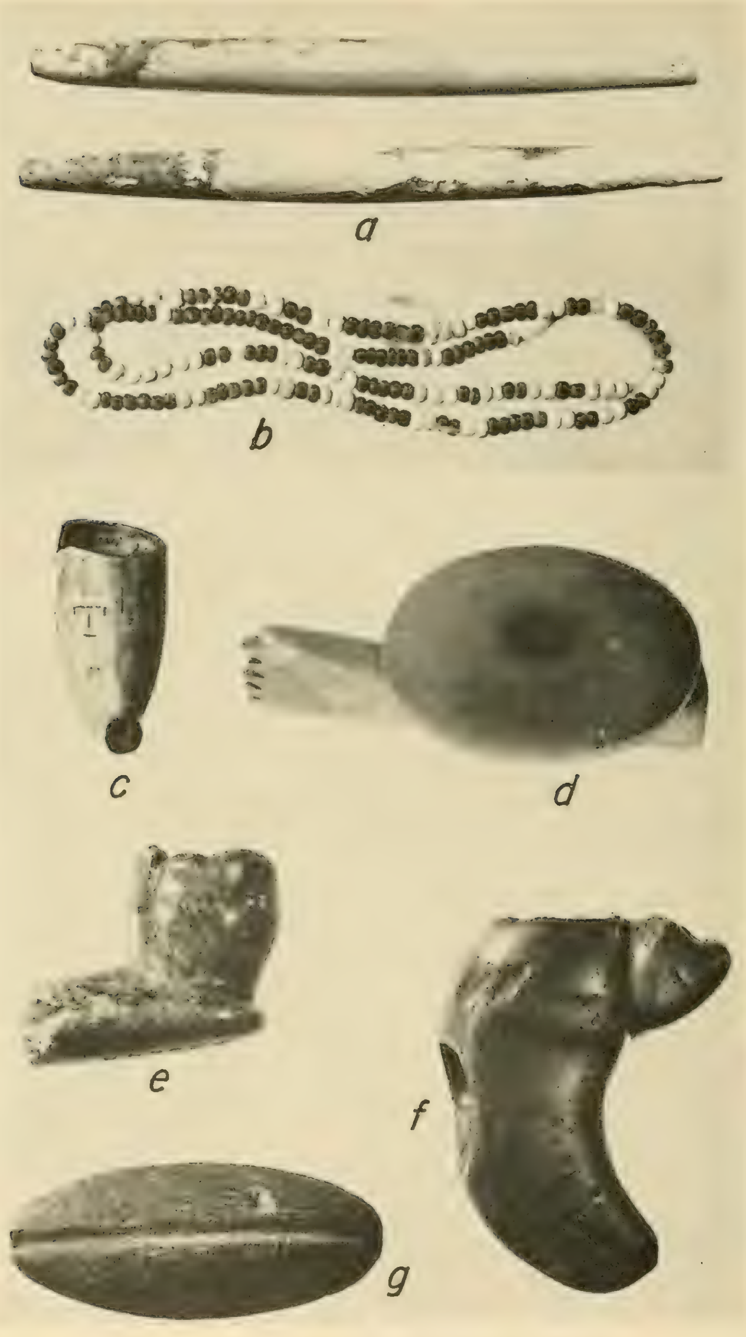
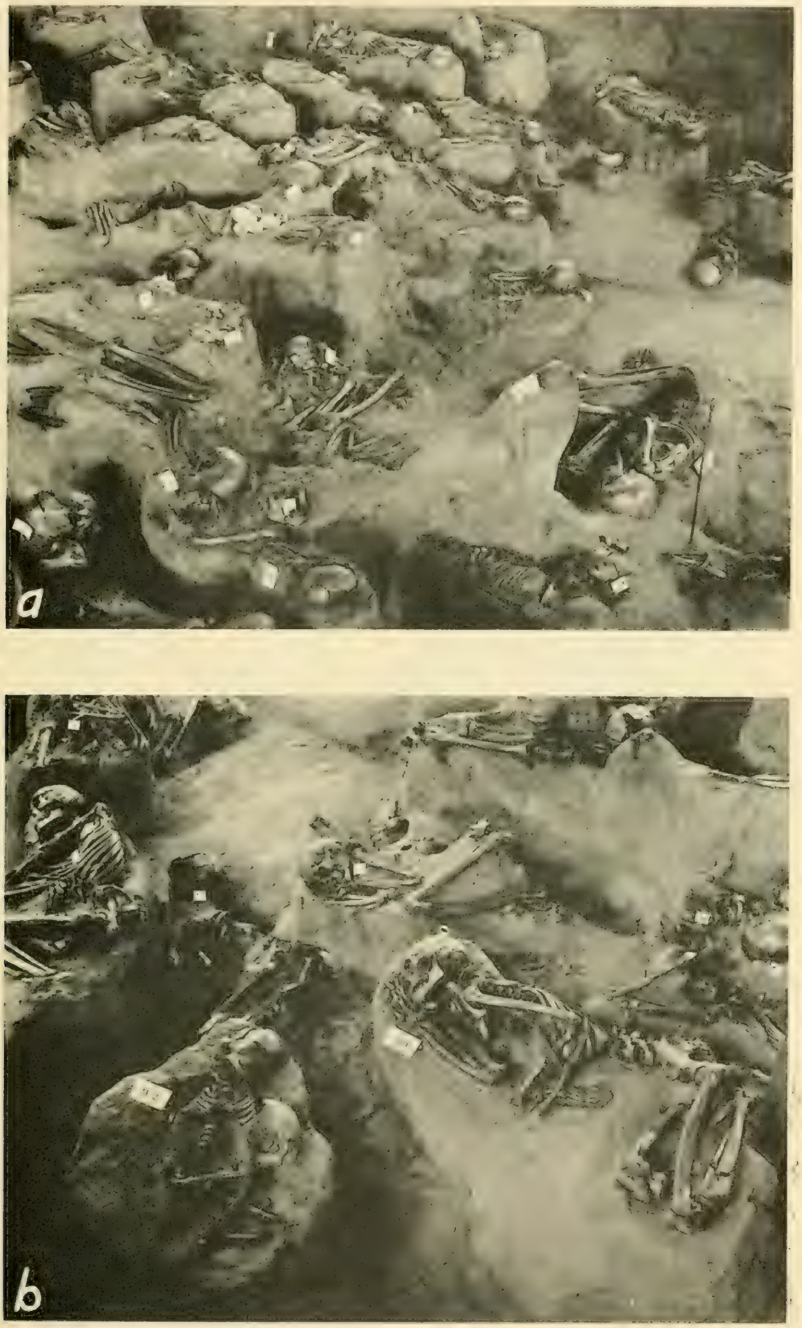
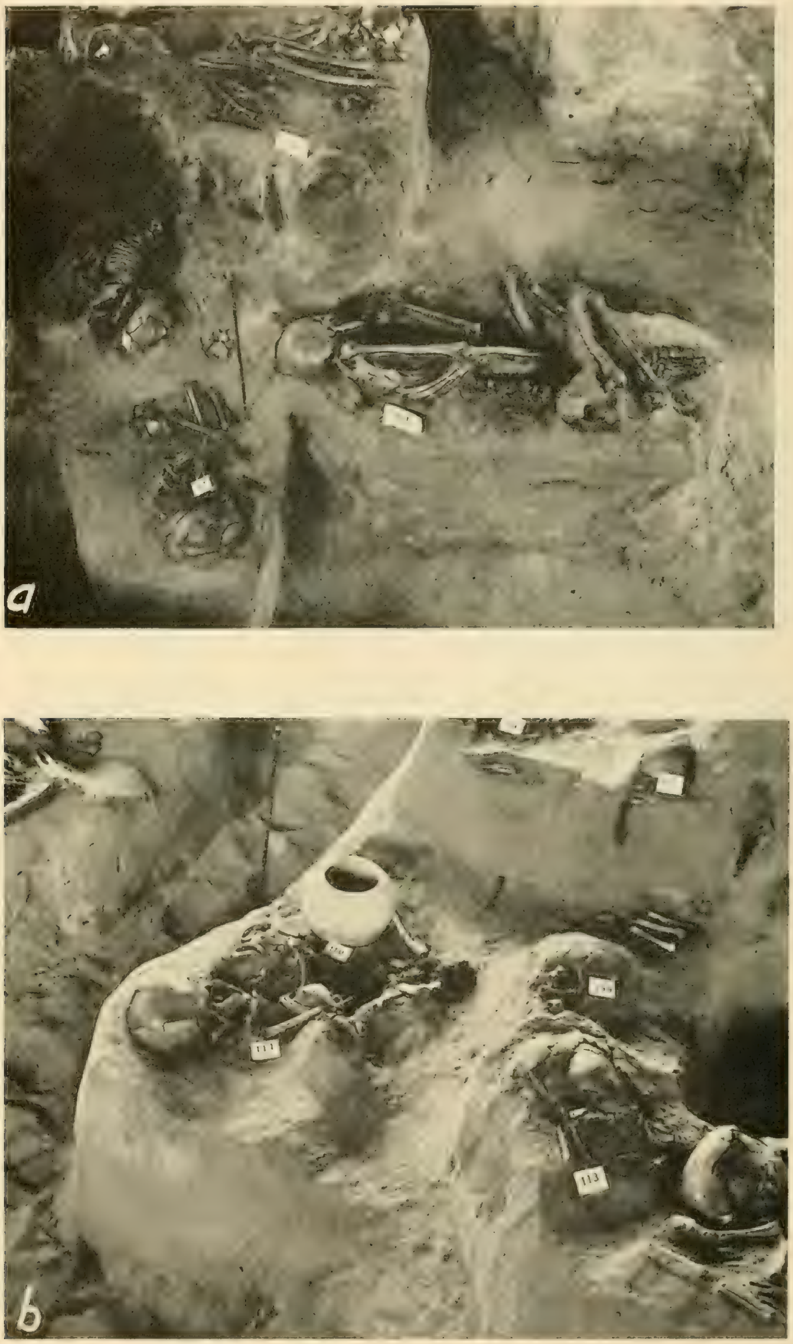
Bone and ground stone objects from Pratt site, 14PT1.



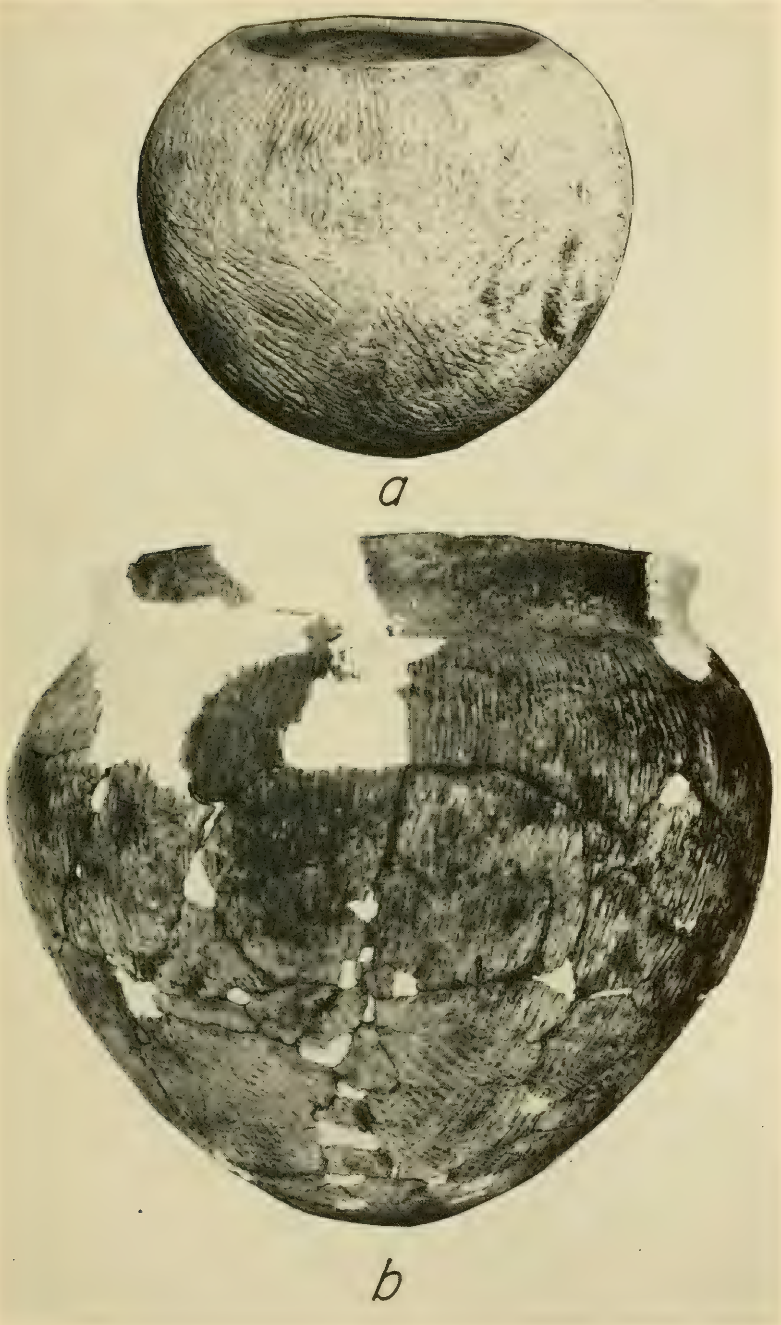
Miscellaneous specimens from various sites in Kansas.



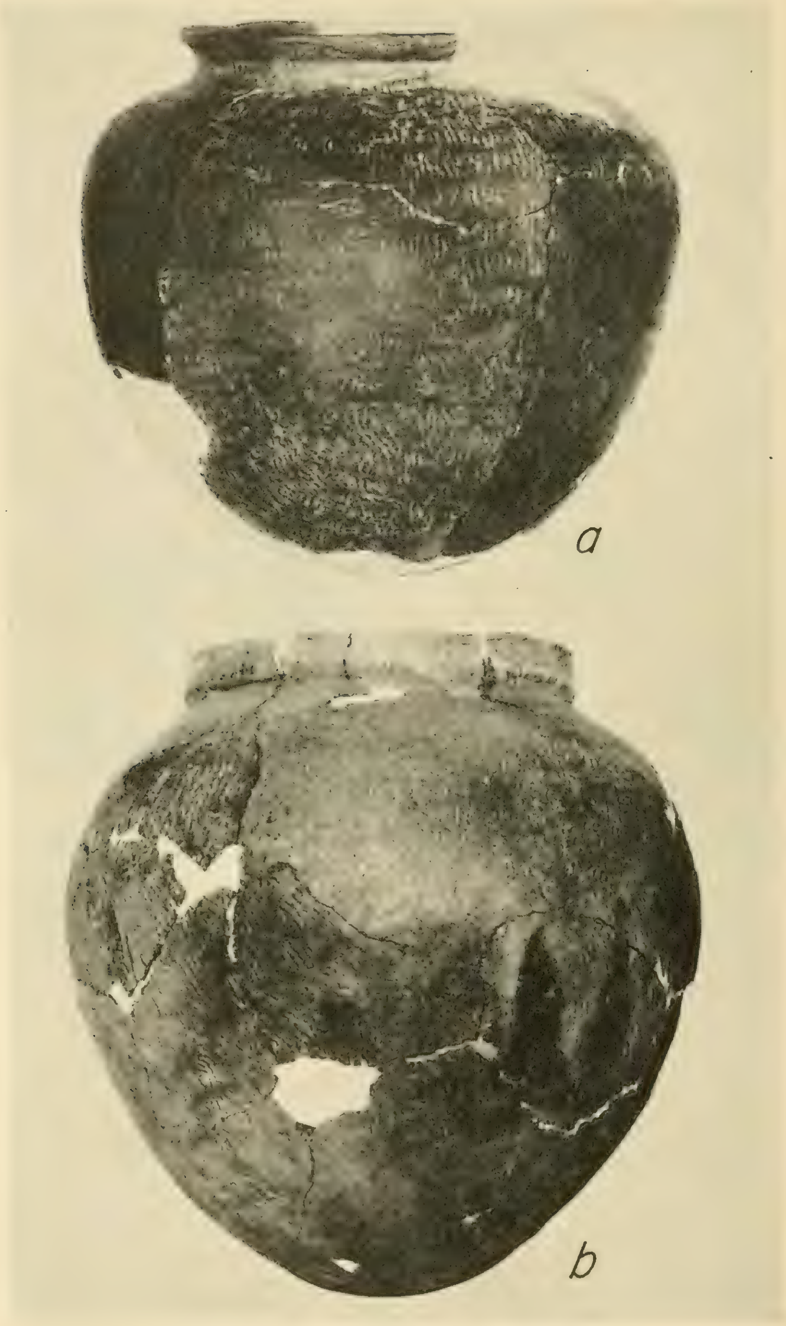
Salina burial pit, 14SA1, Saline County.



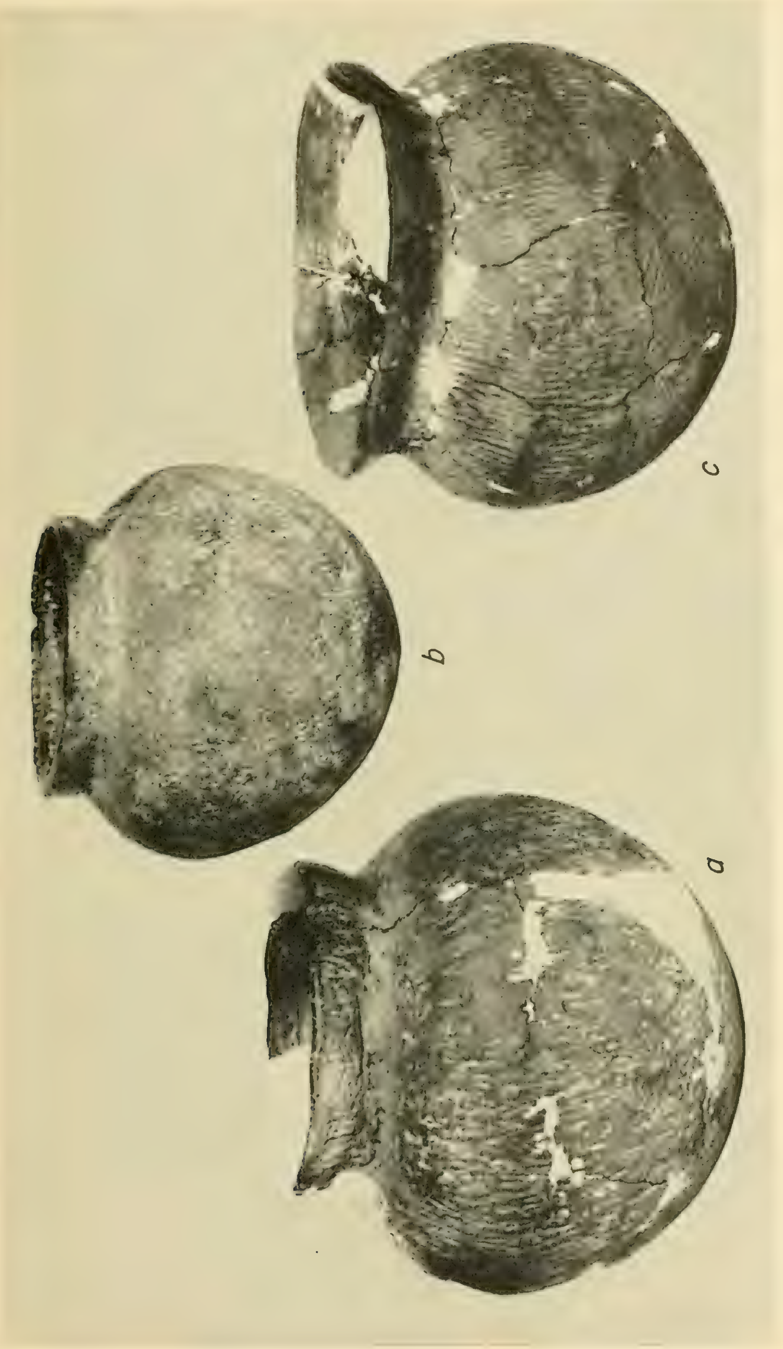
Salina burial pit, 14SA1, Saline County.



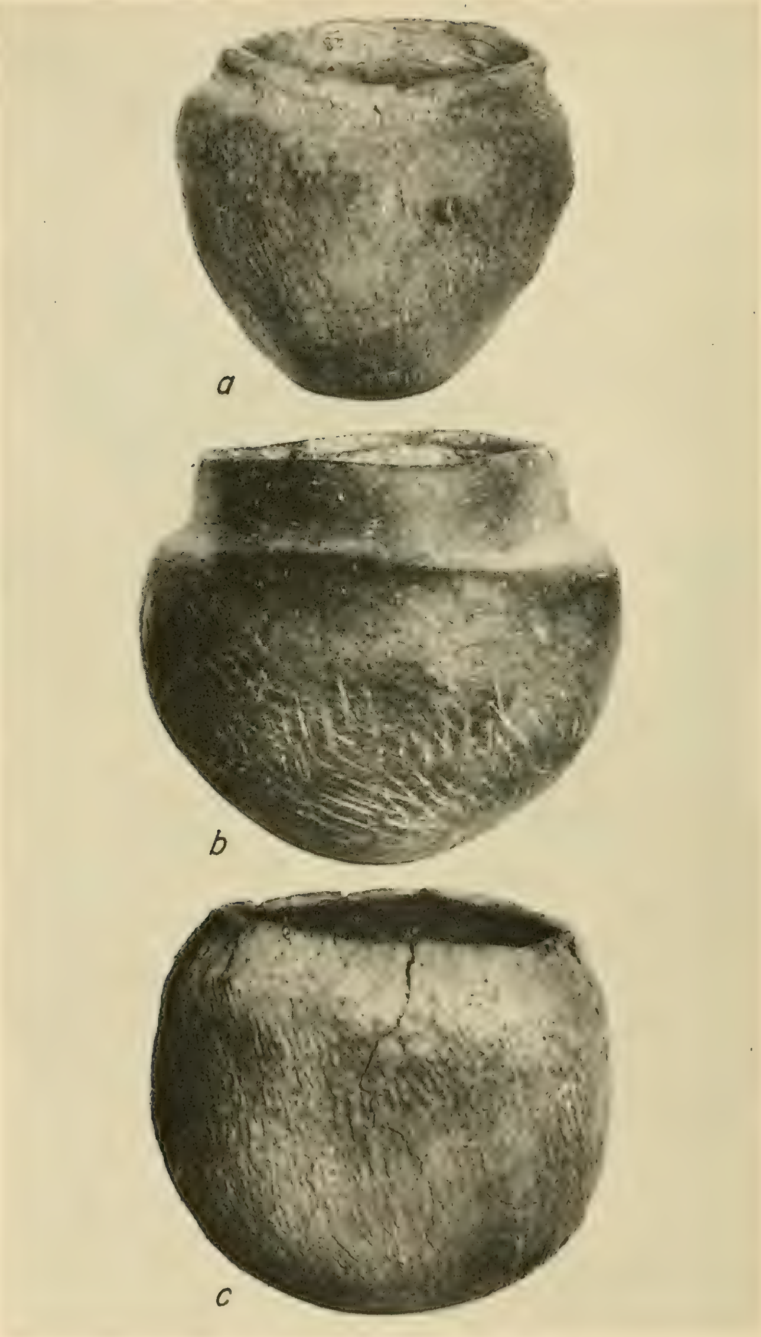
Pottery vessels from Salina village and burial site, 14SA1.



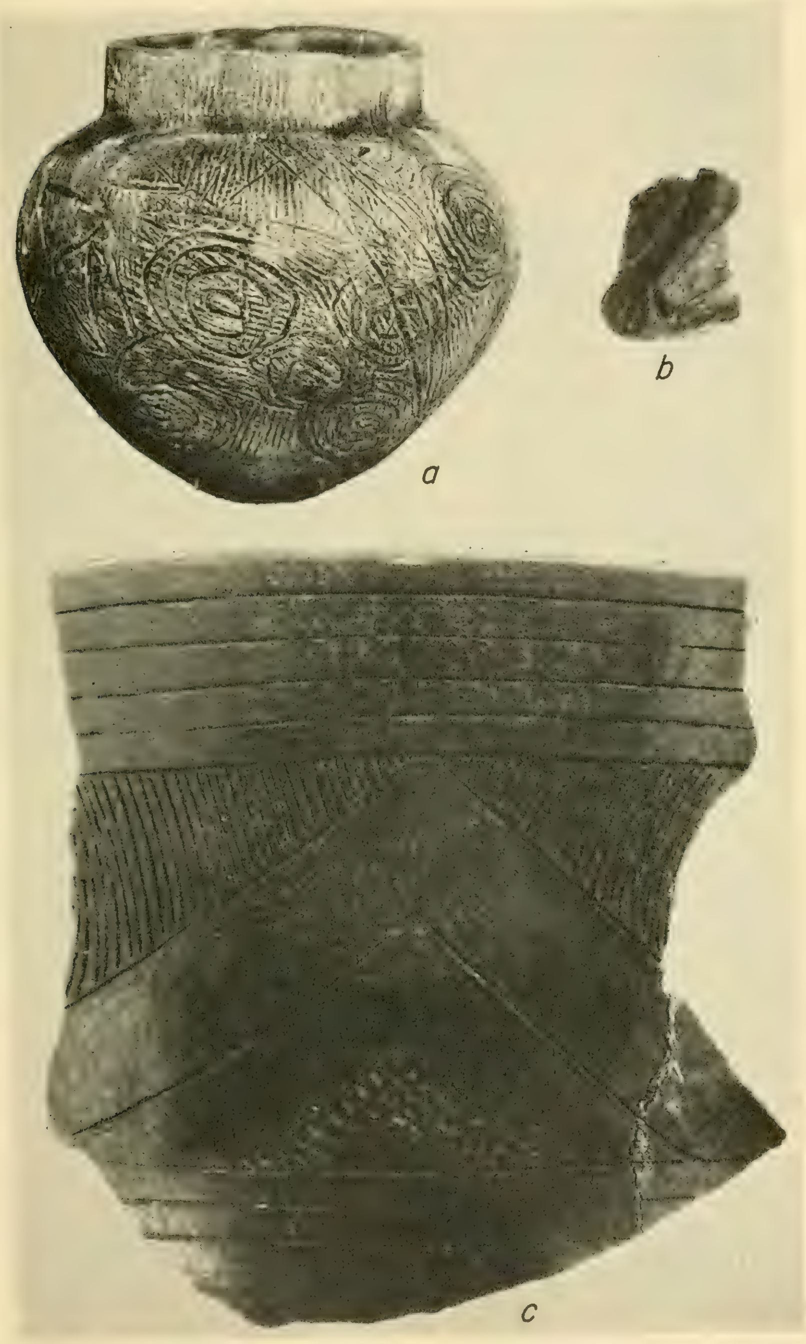
Pottery vessels from Salina village site, 14SA1.



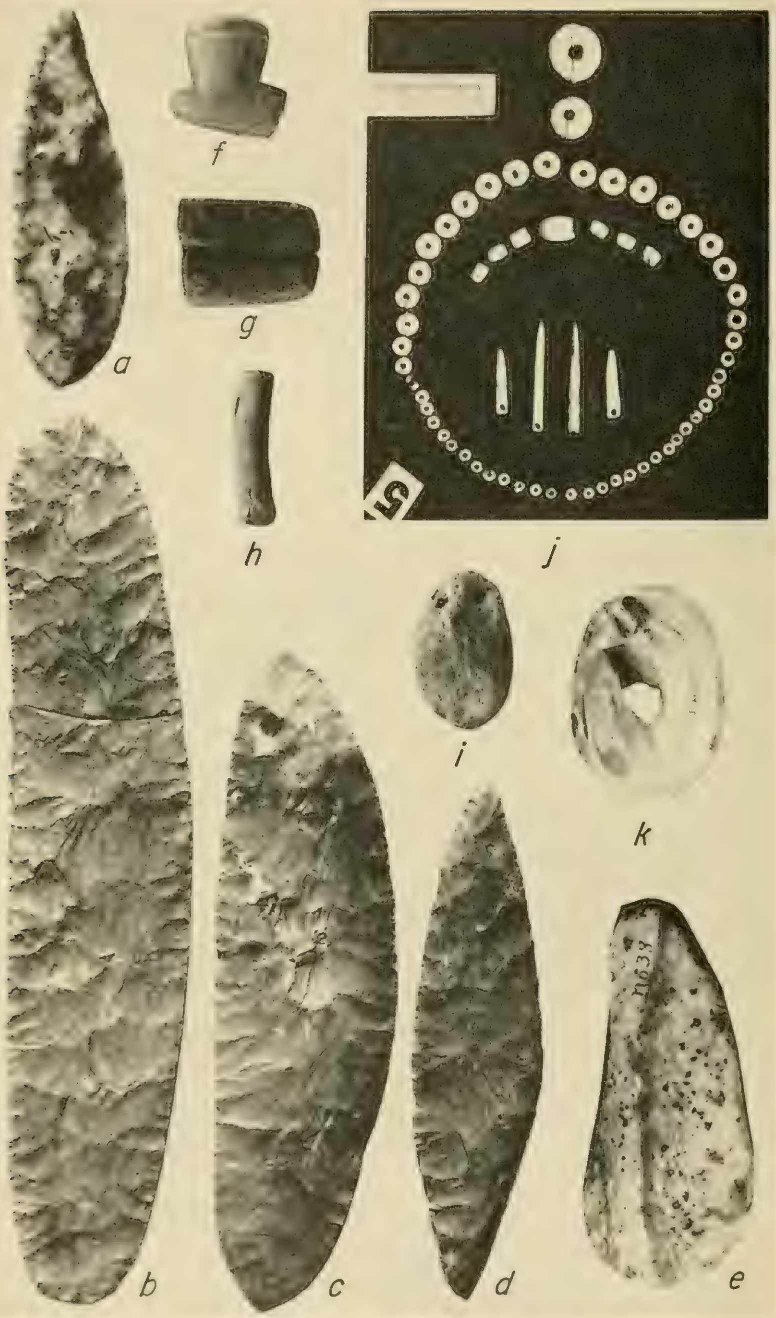
Pottery vessels from Salina burial pit, 14SA1.



Pottery vessels from Salina burial pit, 14SA1.



Pottery from Salina village and burial site, 14SA1.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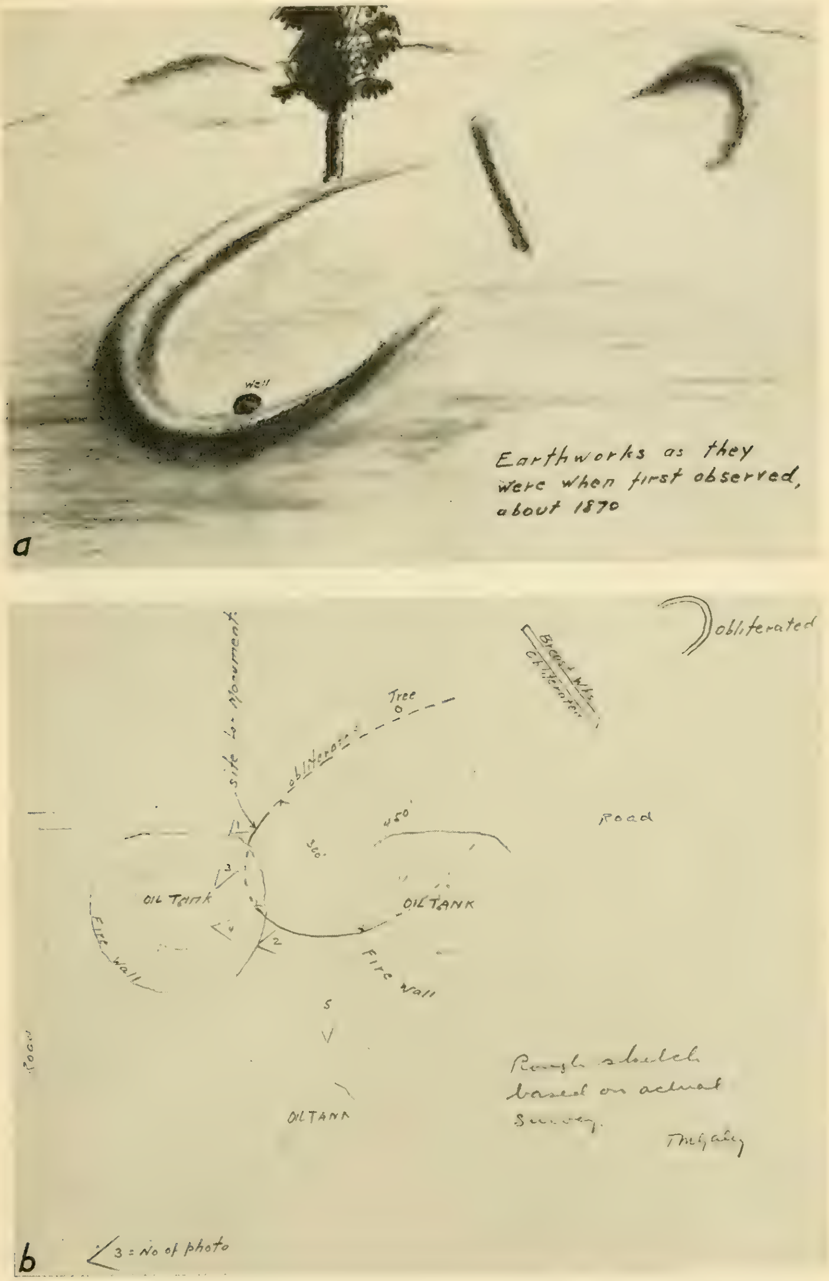
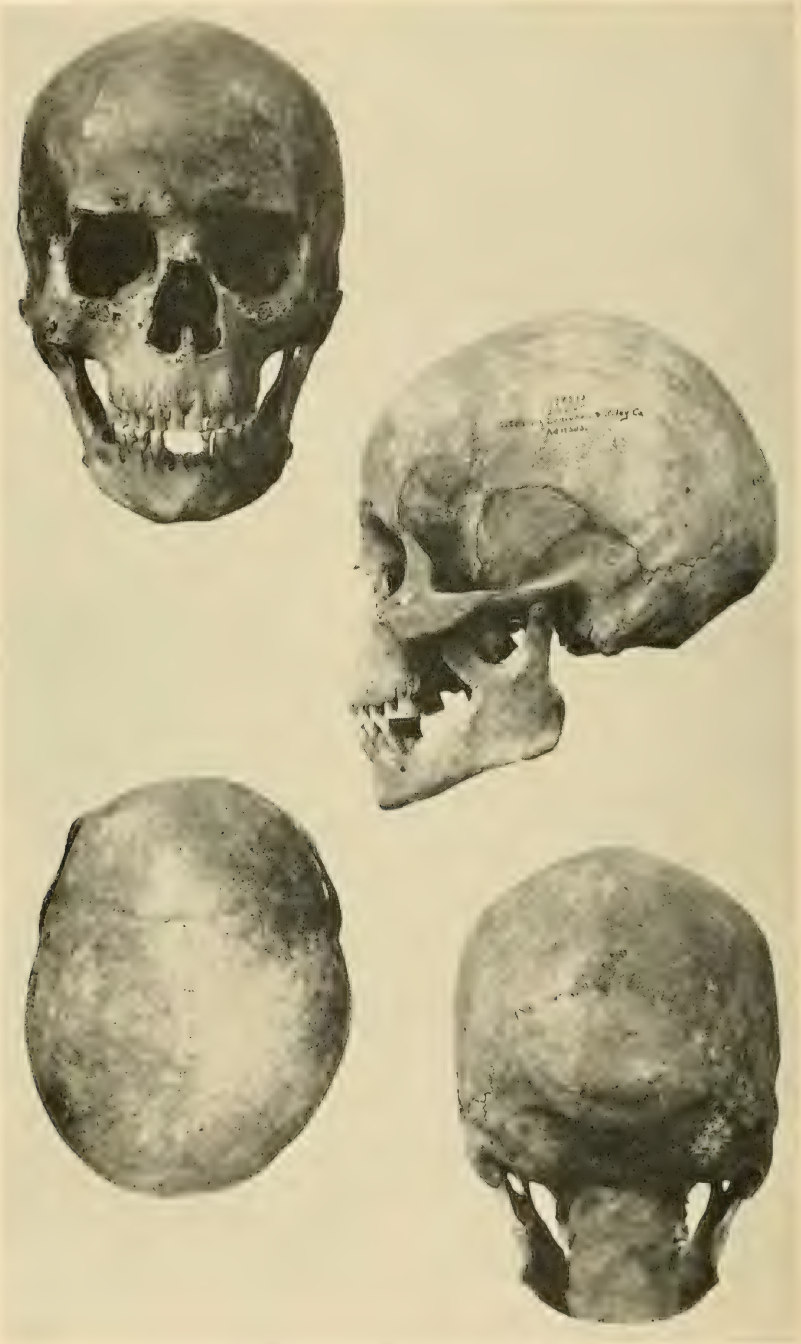
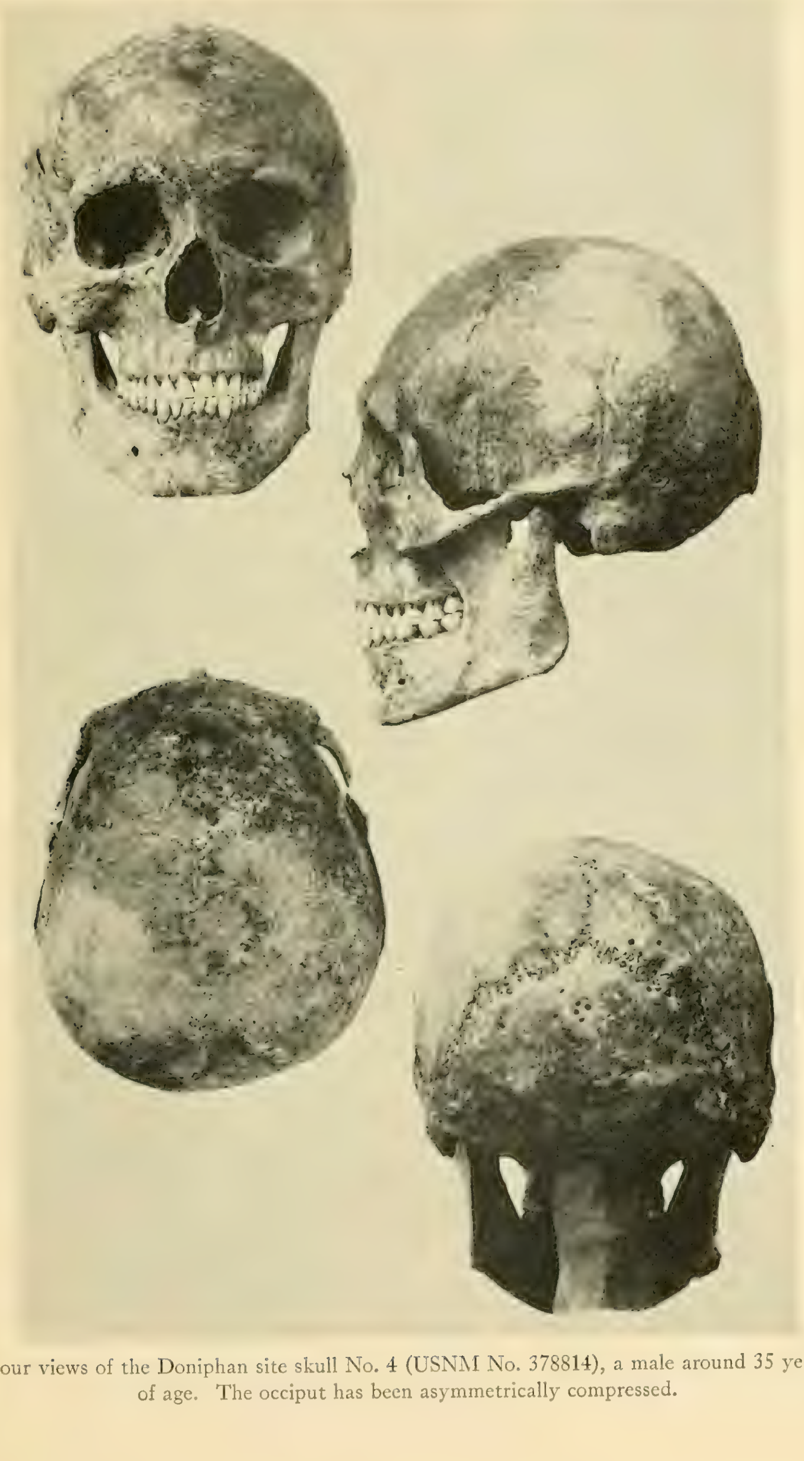
Objects of stone, pottery (*i*), antler (*h*), and shell from Salina village and burial site, 14SA1.


Well
Earthworks as they were when first observed, about 1870
a
Site of Monument
obliterated
Tree
Breast Wks obliterated
obliterated
450'
300'
Road
1
3
OIL Tank
4
2
OIL TANK
Fire wall
Fire wall
5
OILTANK
Road
Rough sketch based on actual survey.
TMGaley
b
3 = No of photo

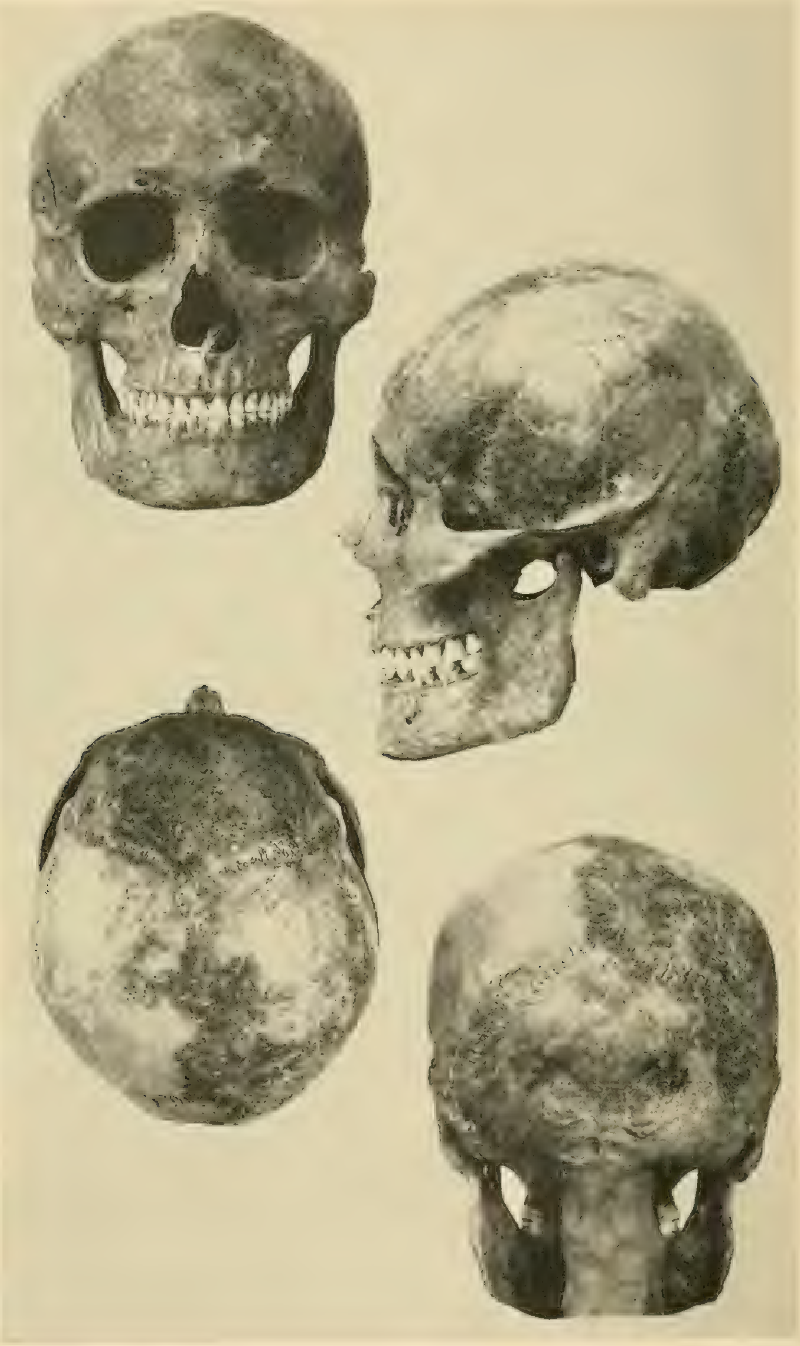
*a*, Neodesha "fort," 14WN1, Wilson County, as it is thought to have appeared about 1870. Sketch by T. M. Galey. *b*, Sketch map of remaining segments of Neodesha earthworks in relation to modern oil storage tanks. Sketch by T. M. Galey.



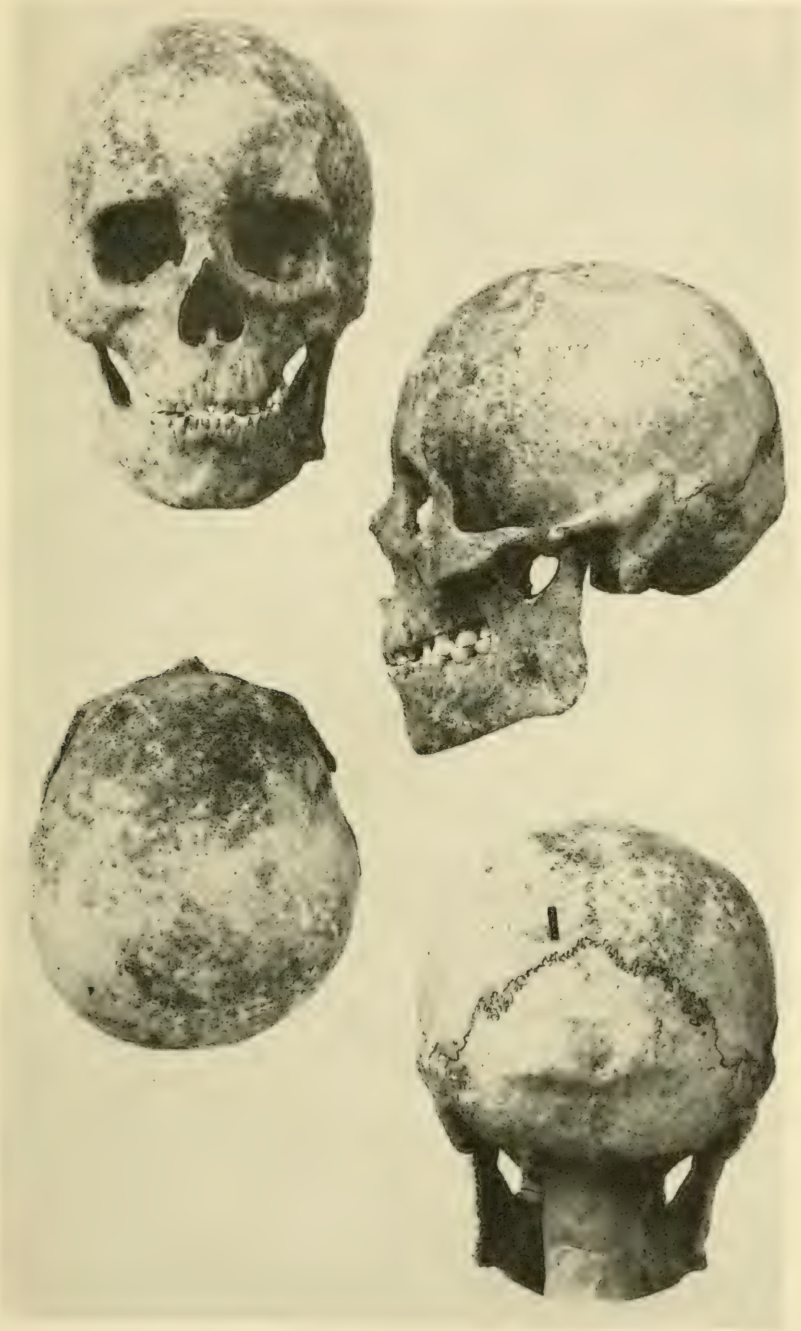
Four views of the Doniphan site skull No. 3 (USNM No. 378813), probably a female around 40 years of age. The occiput has been asymmetrically compressed



Four views of the Doniphan site skull No. 4 (USNM No. 378814), a male around 35 years of age. The occiput has been asymmetrically compressed.



Four views of the Doniphan site skull No. 10 (USNM No. 378819), a male about 30–35 years of age. The occiput has been asymmetrically compressed.



Four views of the Doniphan site skull No. 11 (USNM No. 378820), a female around 35 years of age. The occiput has been asymmetrically compressed. The opening in the back part of the left parietal may have been the cause of death.

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